

GULICK HYGIENE SERIES

EMERGENCIES



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SCHOOL
DEPARTMENT

...and the world was created.

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BY

LUTHER HALSEY GULICK, M.D.

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THE GULICK HYGIENE SERIES

Book Two

EMERGENCIES

BY

CHARLOTTE VETTER GULICK



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PREFACE

A clipping bureau has for nine months furnished the author with newspaper accounts of accidents to children. These have been tabulated and analyzed.

Decision as to the classes of accidents which should and which should not receive particular emphasis has been reached by a careful study of these records, supplemented by the lessons of a large range of personal experience.

The book has, therefore, been written on the basis of concrete cases, not from theory nor from a compilation of what has generally been written in first-aid books.

To several distinctive features of the book especial attention is invited:

1. The new method of artificial respiration which has been adopted in England and in various other European countries. The method is so simple that children can use it; it is easily learned, and once learned not easily forgotten.

2. The water treatment of burns until the doctor comes.

3. The necessity of warning children about crossing streets. It appears that about one third of all serious accidents to children are due to this cause.

4. The fact that most dog bites come as a result of provocation. More boys are bitten than girls or adults. Particular interest attaches to the table showing that England exterminated rabies in four years by having all dogs muzzled.

5. The futility of fear of snakes and lightning. The number of accidents from these causes is practically negligible.

6. The value of caring for little cuts and burns which affords practice for the treatment of more serious injuries.

7. The importance of shutting doors and windows in case of fire so as to stop draughts, thus confining the fire to one room or floor.

8. The soap-and-water treatment for ivy poisoning.

9. The need of familiarizing children with the use of antiseptics.

It has been kept in mind that it is to the minor treatment of injuries, such as cuts, stings, and burns, that children should give especial attention.

The thought of the author has been more how to avoid accidents than what to do in case of accidents.

The illustrations for the book have been gathered from many sources. Most of them are from photographs taken by or for the author, and have never been used before; others are in common use in first-aid books.

Grateful acknowledgment is due to Dr. G. Basil Price of London for the use of the picture of the chickens, and

those of the frogs' spawn and the tadpoles; to Bellevue and Allied Hospitals for the use of the Fordham Hospital pictures; to Miss Annie Oakes Huntington for the poison-ivy and swamp-sumac pictures; also to the Society for the Prevention of Cruelty to Animals for the dog-ambulance picture. The pictures of the skin, illustrating the three degrees of burns, are purely diagrammatic.

The author is deeply indebted to friends of the medical profession who have answered questions and read the manuscript while in preparation.

C. V. G.

EDITOR'S NOTE

We are in the midst of a world-wide movement tending toward the increase of health and the conservation of human vitality. The average length of life has been increased within comparatively recent times from approximately twenty-three years — which is the present average length of life in India — to forty-four years in America and fifty years in Sweden. We have progressively conquered, one after another, the great diseases that in the past seriously decimated our kind. Typhus, typhoid, scarlet, and malarial fevers are under control; the plague, smallpox, rabies, diphtheria have been mastered to a large extent. The new movement looks not merely to the exclusion of disease, but to the positive building up of the power to live — fully, efficiently, happily. It concerns itself with such matters as food, fresh air, sleep, posture, worry, etc. The object of this series of books on hygiene is to teach the fundamental facts of health in such a way that the teaching shall result in the formation of health habits by the children.

Book I, *Good Health*, gives the general point of view, and largely makes its appeal by telling what are the actual results of various ways of living.

Book II, *Emergencies*, teaches what to do in case of accidents, and particularly how to avoid them.

Book III, *Town and City*, tells about the hygiene of the community, i.e. the necessity for clean water, clean streets, ventilation, etc.

Book IV, *The Body at Work*, tells about circulation, about digestion, and how each bodily function may be kept in most favorable action.

Book V, *Control of Body and Mind*, tells about the use of the senses and the nervous system.

Each of the books of this series gives careful attention to the important bearing of these subjects on alcohol and narcotics.

The book on *Emergencies* bases its claim to utility upon the fact that emergencies mean highly dramatic and emotional moments. If we can seize those moments and make of the occasion a means to give the child not only information but also habits that shall stand him in good stead in the daily conduct of life, the book will have accomplished its end. Emergencies and accidents may be avoided to a large extent by rational living and action. This fact is the basis of good health.

For example, it has become so evident that engineers who are even slightly under the influence of alcohol are not reliable when in that condition and are apt to make mistakes resulting in disaster, that it is now the common practice among railroad and steamship

companies to refuse to employ those who are known to drink.

If, during this present great wave of interest in good health, we can fasten upon the children habits that will raise the average of health, the length of life, and the happiness of our kind, this accomplishment will constitute another of the splendid achievements of our schools.

LUTHER HALSEY GULICK

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EMERGENCIES

CHAPTER I

THE IMPORTANCE OF THE STUDY OF FIRST AID TO THE INJURED

It would be remarkable if there is a child living who has not had some kind of an accident at one time or another. Cuts, burns, nosebleed, slivers, hiccoughs, stings, and choking are of everyday occurrence. It is not usual to call a doctor when one has a slight cut, yet there is a right way and a wrong way to take care of even so small a wound as this. If cared for rightly, no pus will form and the cut will heal within a few days. But if neglected, even a small cut may make trouble for a long time and finally require the attention of a doctor.

I know a girl who was disabled the greater part of a summer because a cut on her leg had not been properly cared for at the beginning.

We do not call a doctor to take care of a slight burn such as every girl who helps in the kitchen is sure to have at one time or another, and yet there is a right and wrong way to treat small burns.

If we take care of the small cuts and burns in the right way, it gives us practice for larger ones. This

practice is thoroughly worth while. Sometimes boys and girls think it is brave to pay no attention to little wounds. They think it looks childish to bother about them. If you ever have this idea, think of the splendid chance for practice you are losing every time you neglect a wound.

It is interesting to see how quickly you can make a wound heal. A little boy I know has learned to sharpen his knife so that it will cut almost like a razor. He has become so expert in knife sharpening that his friends bring their knives to him to sharpen. A few days ago he cut himself badly. The cut was deep and fully a half inch long across the end of his first finger. It bled so freely that several bandages were soon soaked through. It was carefully attended to every day, and in less than a week the cut was healed together. Since no poisonous microbes had been allowed to get into it, it healed without becoming the least inflamed.

We know much more about taking care of wounds now than we did once. The use of antiseptics, the microbe-killing solutions, is a wonderful help in this and is quite new.

You know workmen often get insured against accidents. Since the doctors have learned to use antiseptics, one insurance company has cut down the time allowed the workmen for getting well from sixteen days to eleven days. That is, on the average it takes wounds

five days less to heal than in the days when antiseptics were unknown.

Knowing what to do at the right time saves suffering and often death. On June 3, 1908, a boy and a girl in



FIRE DRILL IN A NEW YORK PUBLIC SCHOOL

New York saved the lives of nine people at a fire. I doubt very much if they would or could have done this, had it not been that they were accustomed to the wonderful fire drills in the public schools. They kept their

long he will blame himself. The revolver was old and broken. He had no idea it was loaded. That is always the case. Children should be brought up to treat every pistol or rifle or gun as if it were loaded. They should learn to hold it with muzzle toward the ground, but not



CARRYING A GUN CORRECTLY

pointed toward the feet. Never point a weapon at any one, no matter how certain you are that it is not loaded. It is not safe. Hundreds of persons are shot every year by people who are "certain" their weapons are not loaded. People cannot be certain about things of that kind. No memory is absolutely trustworthy. Besides, some one

may put a cartridge in your revolver when you do not know it.

I heard of a boy who went out hunting one day. He shot at different things, but the rifle did not go off. He came home and pointed it at his father's best cow. Next he took aim at an old hen, and that time the rifle went off and the hen was killed. It taught him the lesson that you cannot be certain about firearms being harmless. Too often the little rhyme tells a true story:

Boy, gun,
Joy, fun,—
Gun bust,
Boy dust.

Here are two more records out of the newspapers:

"Carrie W., a nine-year-old school girl, was seriously injured by playing with some revolver cartridges. She struck one with a stone, and the exploded cartridge blew off three fingers of her left hand."

"William C., because he wanted to hear a dynamite cap explode, is in the hospital suffering with a burned face, and the ends of four fingers are missing from his right hand. He hit the cap with a hammer."

Many children are injured by playing with powder and cartridge or dynamite caps. You would think that children would be afraid to play with them, and yet there are many accidents of this kind every month in the year.

AIR RIFLES

I asked a boy a few days ago if air rifles were dangerous. He said, "Oh, no, the bullets sting a little but they are not dangerous." I had heard that they were dangerous, and that in some cities they were trying to pass a law forbidding boys to have them. I have learned since that air rifles are not all the same. Some are not dangerous, and some are. I am going to tell you about a boy who thought his air gun was harmless.

Joe was having a Wild West Show in his back yard. He was armed with an air rifle and started firing at a bull's-eye. He hit the mark after several failures, and was cheered by the spectators. Then he took another shot, and Frankie, his best friend, fell down with a scream. Yet no one thought he had been hurt, for there had been so much playing at falling dead that they thought he was only making believe. But when they saw his brother Willie rush screaming to his side and saw blood coming from Frankie's right eye, they knew full well that something had happened. He was taken to the hospital, but before the doctors had time to examine him he had died. Joe, in the meantime, ran through the cellar and to his church and prayed that God might save Frankie's life. It was there the policemen found him. They walked up the aisle to the very front, but Joe did not hear them until they touched his shoulder. Then,

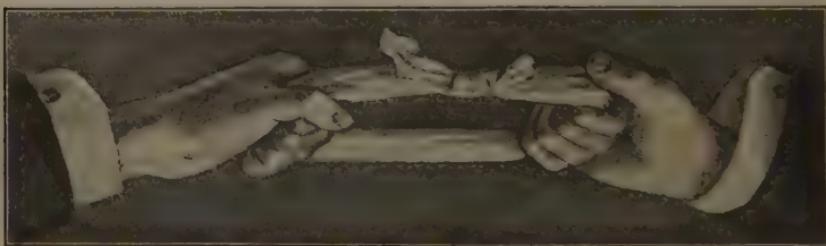
with his face stained with tears, he said, "He is n't dead, is he? Honestly, I did n't mean to do it." The policemen tried to comfort him, but it was of no use. They took him to the Children's Society, and there he had to be put in a room alone so that other boys would not be disturbed by his sobs. It was very late when he finally cried himself to sleep.

TO THE TEACHER. It may seem rather unimportant to have children practice holding a gun correctly, but it is only by doing it that the average child can really learn how it is done. It is no use to assume that boys are not going to handle guns, for practically every boy handles a gun at one time or another. A wand or a stick of any kind is all that is necessary for this practice. It is well to remember that the most effective knowledge comes through action.

CHAPTER III

HOW TO CARRY THE INJURED

If an accident has happened, the first thing to be considered is how to get a doctor, or how to get the injured one to a doctor or to a hospital as soon as possible. One should not attempt to carry a badly injured person.



RING SEAT MADE WITH A HANDKERCHIEF

Carrying the patient, in case of a broken leg, has been known to make a compound fracture of a simple one.

If the attempt is made to carry the patient to a doctor, the easiest method must be considered, both for the patient and for those doing the carrying. We all know the "Lady's Chair," made with four hands or three hands. The three-handed seat leaves one hand free to support the patient's back. Both of these seats, however, are difficult to hold. The hands tire quickly, and are likely to slip. A seat made with a ring is more easily held and

leaves two hands free to support the patient's back. This ring can be made with a handkerchief or a towel or a belt or piece of rope. In tying the ends one should be careful to use the square or reef knot that does not slip (see page 40). A handkerchief makes the right-sized ring. Notice that it is to be grasped from underneath.

Another way of carrying an injured person is to make a larger ring with a blanket or sheet by tying the diagonally opposite corners together. Two persons place this ring over their heads, as shown in the picture. To get the patient on it, it is necessary to kneel and draw him carefully upon the loop made by the sheet. This seat has the advantage of leaving all four hands free to help support the patient. It is about the easiest way for those who are doing the carrying. It might be very helpful for boys off camping, if any accident should happen. This seat should be high. If the ring is very long, it brings the center of gravity too low for the comfort of those doing the work. Try making such a seat, and you



BLANKET RING



ANOTHER METHOD

without much fatigue. Of course a person with broken ribs ought not to be carried in such a way. The stronger of the two bearers should take the back position, as he has more weight to carry.

Another method of carrying an injured person is this: seat the person in an ordinary chair, tip it back to the angle most comfortable for the patient, and let two persons carry it, one by the back and the other by the fore legs.

can see for yourself how much easier it is to have a high seat than a low one.

Another method of carrying a helpless person is this: one person puts his arms under the patient's arms from behind, and another person grasps the legs on each side, as shown in the picture. In this way the patient may be gently lifted from the ground and carried a long distance



A LITTER MADE WITH A CHAIR

A person might be utterly helpless, as when overcome with smoke, and you might happen to be the only one on hand to rescue him. In such a case get the patient on a chair if possible, put your shoulder against his stomach, grasp an arm, and pull him on your shoulder, balancing him there just as you would a bag of flour. Practice carrying some one in this way. It is a good plan to find out how it feels. Many a fireman has carried people out of burning buildings in this manner. This method leaves one arm free with which to hold on to a ladder.

An improvised litter is another way of carrying injured people. One can be made in various ways. Take



HOW ONE PERSON MAY CARRY
ANOTHER



LITTER MADE WITH BLANKET AND OARS

two poles (two oars, or two tent poles, or whatever is at hand) and roll a blanket onto each pole until you get the desired width. The weight of the patient will hold

the blanket on the poles. If a blanket is not at hand, coats can be buttoned around the poles, or sacks might be cut open and the poles pushed through.

All these ways of carrying people you can practice on your companions or brothers and sisters. It is good sport. Besides, who knows how valuable such knowledge may sometime prove?

TO THE TEACHER. Unless the children are drilled in making these seats in the class room, they will not learn how to use them. Simply reading the text and seeing the pictures are not enough.

A good plan would be to get a child to bring a blanket or sheet to school and tie the opposite corners together. The ring thus made should be adjusted over the shoulders of the children. It will need adjusting to fit the children of different sizes. Let the children try to use it in turn. In this seat it is very important to have the center of gravity in the right place. When the ring is too large it brings the seat so low that it is difficult for those carrying to stand up straight. The children should always be impressed with the fact that it is important to stand straight.

This practice is good exercise and will do more to fix the method in the children's minds than reading the text a dozen times.

Another day try the ring seat. Do not try to teach more than one method at a time.

The Lady's Chair is not worth while; besides, the children know it.

If the boys can get two poles or oars, the same blanket used for the seat can be used in making a litter.

CHAPTER IV

PLAYING IN THE STREETS

During the month of June, 1908, one third of all the accidents to children, as shown by the notices in the newspapers, were street accidents due to moving vehicles of one kind or another, or to children being trampled on by horses.

162 children were run over by trolley cars.

142 children were run over by wagons and carriages.

84 children were run over by automobiles.

50 children were run over by bicycles.

52 children were run over by trains.

79 children were trampled on by horses.

As you see, more of the accidents were due to trolley cars than to anything else. No motorman or fireman or chauffeur wants to run over a boy or a girl. From the way people sometimes blame motormen, it almost seems as if they thought that the motorman liked to run over children.

I want to tell you two stories, one about a fireman and the other about a chauffeur.

One Christmas morning, several years ago, the fire alarm rang in a section of the city where the streets were

narrow and crowded with men and women and children. Out dashed the fire engine, and there was a brave fireman on the driver's seat. He turned a corner, and there, right before him, were two children playing in the street. He did not hesitate a second, but guided his three beautiful horses onto the sidewalk. They dashed through a large plate-glass window and the brave driver was instantly killed.

On another morning a little boy ran directly in front of an automobile. The chauffeur did not hesitate, but turned his machine onto the sidewalk, smashing it to pieces and severely injuring himself. But he saved the boy's life.

Sometimes firemen and chauffeurs, by risking their own lives, can save the life of a child. Often and often they have done this. But did you ever think how it is with a motorman? His car is fast on a track. He can't turn out for any one. All he can do is to put on the brakes. I am sure he always does the best he can, for no motorman wants to run over a child.

The following notice came to me as I was writing this chapter. A lovely little seven-year-old girl, who was going on an errand for her mother, ran in front of a north-bound car and came directly in front of one that was going south. The motorman had been a faithful worker on the line for twenty-three years, and when he saw how helpless he was he fainted and had to be carried off the car unconscious.

Does it not seem clear that very little children should not be left uncared for on the streets, and that older children should learn to be more careful?

Cases such as the two following are happening every day. Arthur B. and a friend were amusing themselves chasing cars. While running behind a west-bound car,



Too LATE TO STOP

Arthur suddenly turned across the other track and was hit by an east-bound car. This car struck him on the side of the head and hurled him to the ground. He was made unconscious and was taken to a hospital. Fortunately, the cars were moving slowly and he was not seriously hurt.

Ada Walker, a fine roller skater, was out with some friends enjoying her favorite sport. A wagon passed

by and she caught hold of it. For a few seconds she coasted happily along, and then, as its speed increased, she let go with a laugh and turned directly in front of an automobile, which she had not noticed. She was knocked down and her skull was fractured. Every means possible were used to save her life, but she never regained consciousness.

It is sport to "hang on," but when we know the number of children killed every year or seriously injured for life, it seems hardly worth the risk. What do you think about it?

GETTING ON AND OFF STREET CARS

Many accidents occur, especially to women and girls, in getting on and off street cars. Women do not seem to learn as readily as men the right way to do this. Some day stand on the street and watch a group of women get on or off a car, and count the number that do it correctly. It will help you to remember the right way.

Study these pictures, and don't let yourself be classed with those who do not know how.

I have a friend who has a beautiful automobile, but she says she never enjoys it because of the fear of sometime running over some one. Think of how terrible it must be for a driver to know that a child has been killed



THE RIGHT WAY TO GET ON

This boy placed his left foot on the step and grasped both handles, facing toward the front



THE WRONG WAY TO GET ON

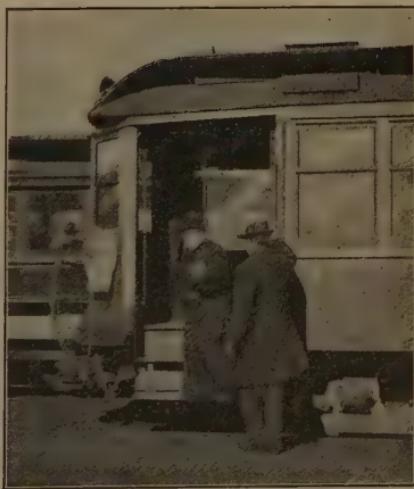
This man grasped only the rear handle and faced toward the rear



THE RIGHT WAY TO GET OFF

(From a School Exercise)

The girls in this picture faced toward the front and held the handle until one foot was firmly on the ground



THE WRONG WAY TO GET OFF

If the car had started this woman would have been thrown on her back. She took hold of neither handle and faced toward the rear

or hurt by his vehicle. And yet, in almost every case where such an accident happens, the fault is with the boy or girl who acts heedlessly.

I want to give one more case. An automobile ran over a boy eight years old. The woman in the automobile sprang out and took the boy's head in her lap and between sobs begged the child to open his eyes, promising to give him a pony and cart, or a sailboat, or a steam launch, or anything, if he would only smile again. But he died in her arms. The boy had been roller skating, holding on to the coat tails of another boy, who in turn was hanging on to the end of a wagon. He let go and, just as Ada did, he darted in front of the automobile, which was coming in the other direction.

Boys sometimes think they are showing bravery by standing in front of trolley cars or other approaching vehicles. I do not think they would do this if they realized that it was not bravery at all, but only a poor kind of "showing off."

CHAPTER V

SPRAINS

There are eight little bones in the wrist and seven in the ankle. These little bones are held together by thin fibers called ligaments (see picture). These ligaments are made up of very fine fibers and are attached to the bones.

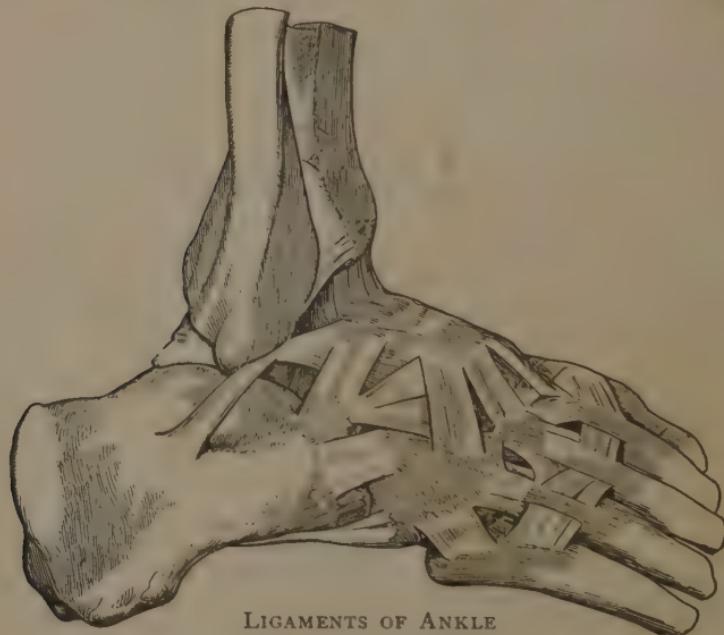
Now, when a person扭 his ankle it may mean any one of several things. It may only mean that some of the fibers of a ligament have had a little extra strain put on them. This hurts for a few minutes, but amounts to nothing. On the other hand, if the ligament has been pulled away from the bone, or if it has pulled a piece of the bone off with it, the sprain may become very serious. It is often more serious than a broken arm or leg, and



LAGAMENTS OF WRIST

needs immediate attention. Only seldom is the ligament itself torn.

When a ligament is given too much of a strain some blood vessels and lymph vessels are broken. This causes blood and lymph to gather about the sprain, and as



LIGAMENTS OF ANKLE

they accumulate, the sprained ankle or wrist quickly swells. This swelling is injurious, for it keeps the ends of the torn ligaments away from the bone to which they must reattach themselves. It is also very painful, because of pressure on the nerves. Every effort must be made to keep the swelling down. This is sometimes difficult to accomplish.

There are several things to do immediately. Put the sprained ankle, knee, or wrist under a cold-water faucet, and let the water run on it until bandages are prepared. The first effect of cold water is to make the little capillaries contract, thus keeping the arteries from sending so much blood to the injured parts. The lymph is also delayed in its movement.

Cold water can be changed to very hot water which has a similar effect. (Warm water is bad because it relaxes and dilates the parts.) Little by little the capillaries relax, in spite of the applications, and the blood flows to the sprain, but not so profusely as it would have done at first. Now the main thing is to keep the circulation active, to make sure that blood and lymph are carried away as promptly as they come. Oddly enough it is these same applications, alternate hot and cold water, that aid us here, for now they stimulate the circulation, and keep all channels open. It is well to hold the injured joint as high as convenient, so as to let as much blood as possible flow from the joint. Before putting on the bandage, a little well-directed pressure by the hands upon the swelling to drive the extra blood and lymph towards the heart is good practice.

Now we bandage the joint. This must be done so that the pressure will come on the soft parts, as they are the parts that fill up with the blood and lymph. To accomplish this we place little wads of cotton over the soft

parts, fitting them into every hollow and keeping them in place by light bandaging. After the cotton is all placed, the whole joint must be tightly bandaged, but not above the injury. The bandaging should be changed every day, and the joint rubbed a little each time to assist the circulation. This treatment of a sprain is the one most likely not to leave a stiff joint.

Horse trainers, when they have a horse with a sprained ankle, take it out for a little gentle exercise every day. It keeps the ankle supple. If the horse is allowed to stand in the stable without this exercise, the ankle becomes stiff. This exercise acts as rubbing does on our joints.

There is another very simple way to treat slight ankle sprains, which has been very successful. Let the water flow on the ankle for awhile, then put on a pair of laced shoes, lacing as tightly as possible the one having the sprain. Now go for a walk. The tight lacing keeps down the swelling and the exercise keeps the circulation active, and in this way the blood quickly carries away the accumulated lymph and blood. By either massage or exercise a sprain will recover much more quickly and with better results than when it is done up in a plaster cast.

CHAPTER VI

PUNCTURED WOUNDS

Wounds are of various kinds, and can be divided into three groups, each group calling for a somewhat different treatment:

First, punctured wounds, such as those caused by rusty nails, scissors, and blunt-pointed instruments.

Second, cuts, caused by sharp instruments such as knives, hatchets, pieces of glass, etc.

Third, bruises, caused by blows with rough objects or by falls, and the like.

In this chapter we shall give attention to the first group.

Punctured wounds are liable to be more dangerous than other wounds because they are often deep and do not bleed and are not so easily cleansed. They seldom appear to be as serious as they really are, because they are likely to leave a very small opening. These wounds may be caused by nails, often rusty and dirty, as well as by pins, needles, fishhooks, thorns, splinters, glass, and the like. Often a part of the object is broken off if it comes in contact with a bone and so is buried deep in the flesh. This must be taken out.

RUSTY NAILS

There is great danger of lockjaw from rusty-nail wounds. The little microbe called the tetanus germ causes lockjaw. In such a wound as this it finds a good place for itself. The tetanus germ is found just beneath the surface of the soil and in dust, and so it may very well be on the rusty nail itself when it enters the foot. (See picture of the tetanus germ on page 149.) Perhaps the foot may not be clean, and the microbe may be pushed in with a bit of dirty skin, or if the wound is not kept clean it may get in at any time. The first thing to do with such a wound is to cleanse it with water, then with an antiseptic wash, after which it should be gently squeezed so as to make the blood flow from it, and the germs will be very likely to come away with the blood. Now take a piece of absorbent cotton or a piece of clean cloth, soak it in the antiseptic water and put it over the wound, then strap it on with surgeon's plaster or court-plaster, or else bandage it on with a handkerchief or any piece of cloth. If possible, it is better to get a little syringe, such as a clean ink-filler syringe, and squirt some of the antiseptic water deep into the wound.

I treated an injured foot recently by washing it in a quart of water in which a bichloride tablet had been dissolved. Then I squeezed the wound to make the blood flow, put on it a piece of cotton soaked in the bichloride

water, and strapped it with surgeon's plaster. Although it throbbed and was sore for several days, it healed quickly. Such a wound should be watched. If it becomes inflamed, it shows that it has not been sufficiently cleansed, and it should be opened and cleaned again. Even with all these precautions one cannot be certain that it is clean.

One precaution against nail wounds is never to leave a nail in a board where a person is likely to step on it. My father taught me to be careful in this way, and his advice stays with me. I never see a nail sticking up in a board without wanting to put it where it can do no harm.

FISHHOOKS

One of my earliest memories is of seeing a little boy running to the doctor's office with a fishhook in his finger. I had caught fish many times with my brother, and knew how hard it was to get the fish off the hooks, and I wondered how the doctor could possibly get this hook out of the little boy's finger. He did n't try to pull it out or to cut it out. He simply pushed the barb through the skin and cut the shank off with a wire cutter. Then he pushed it out easily. It was not in very deep. A fishhook cannot go in very deep. Of course it was painful, but it was not so bad as I had thought it would be. He then treated it as one would a rusty-nail wound.

I have a friend who always takes a pair of wire cutters with him for just this purpose when he is camping in the summer time. He has never had occasion to use them, but he might have at any time. A person cannot be too careful of the way he handles fishing tackle. Fishhooks should be pushed into corks, or concealed in some way when not in use.

NEEDLES

Such accidents as the following are happening every day: "Little three-year-old Edith was walking about the house with her shoes off when she stepped on a needle. It entered her left foot and broke in two. The doctor was called and removed the pieces."

Whenever an accident of this kind happens and you are able to pull the needle out yourself, examine it carefully to see if it is all there. If not, a doctor should be called to remove the broken-off pieces. They will surely cause trouble if not removed.

My washerwoman came to me one day with a needle half way imbedded in her hand. It was difficult to pull it out, it was in so deep. I had to use a pair of tweezers in order to get a firm hold of it. Of course I examined it to see if it was all there. She felt scarcely any pain afterwards, but it might have made serious trouble. One should be careful not to leave needles and pins in clothes that are to be washed.

SPLINTERS

Splinters are dangerous because little pieces of the wood are so easily broken off, and it is difficult to be certain that all of the splinter is removed from the wound.

One of my little girls, on the first day at the seashore one summer, ran along a pine plank and stubbed her foot on it in such a way that a large splinter was imbedded in the sole of the foot. There was only a tiny opening in sight, and I removed what I thought was the entire piece of wood, but the foot became more sore every day, though we could not see that there was anything there. Finally we took her to a physician; he was obliged to give her ether to get the splinter out. It was deeply imbedded and fully an inch long, and would doubtless have caused blood poisoning if it had been left alone longer.

Small slivers are apt to cause pus to form in a few days and can easily be removed with a clean needle or a pair of tweezers.

CHAPTER VII

CUTS AND BRUISES

In the preceding chapter we have learned about punctured wounds and their treatment, but, as we have seen, two classes still remain to be studied.

CUTS

Many accidents like the following are happening to children all over the country, and every boy and girl ought to know what to do until the doctor comes:

"Edward Kendel fell on a broken bottle and cut his wrist so badly that he nearly bled to death before help could be taken to the hospital."

The first thing to have done in this case would have been to raise the arm, because less blood flows into the arm when it is up than when it is down. Second, one should have placed the thumb or fingers firmly against the place where the blood was flowing and held it until the doctor came. If the artery in the wrist was cut, it could be held for a long time in this way. One should not take the pressure off to see if the bleeding has stopped.

Tourniquets used to be commonly recommended for cuts like this one, but they are used less and less, except

where a large artery has been cut; then they are necessary. They are very painful and often have so injured the soft parts of the arm that they have done more harm than good.

Another boy, Ray, was brought home suffering from a knife wound in his arm. While cutting a branch he fell from a tree onto his knife. In this case the doctor



CUT HELD TOGETHER WITH SURGEON'S PLASTER

cleansed the wound and put a piece of surgeon's plaster on each side of the cut and sewed the plaster together (see picture). This was less painful than having the stitches taken in the flesh. Any one can do this. Then the doctor bandaged the wound. He told Ray to keep it still. Do you see why? You cannot make two sides of a cut heal by "first intention," see page 38, if you are going to move around so as to pull them away from each other every time they begin to unite. Quiet is

necessary. If you are trying to glue a leg in a chair, you put the glue in, tie the leg firmly, and put the chair away until it is dry. The same principle applies in the case of a cut. You want the parts kept together until they are one again.

It may be that a finger is almost cut off, or a toe, or a nose, or ear; but so long as there is any connecting tissue left there is hope of saving the severed member. It should be washed in warm water and carefully put back in place until the doctor comes. Many remarkable cases prove that these parts may grow together again.

I know a little girl whose thumb was almost cut off. It was cut through the bone, but was quickly replaced and bandaged on. Now you can only see a slight scar.

The seriousness of a cut does not depend so much on its size as on its position.

OPEN KNIVES AND SCISSORS

From the time babies begin to walk, fathers and mothers try to teach them the dangers of going about with open knives or scissors in their hands, or with sticks and other pointed things in their mouths. Yet children do forget. They say "it is too much trouble to shut the knife." My boy said that to me only a few days ago.

Ordinarily we do not hear of accidents from these causes, for they are not often serious. But they might easily be. There is hardly a child that has not had a sore

place in the roof of the mouth at some time or other due to just such an act of heedlessness.

Indeed, many accidents of this kind do happen right along. I will give you several accounts of these that have come to me in my newspaper clippings. Here is one about Earle Ash, a boy twelve years old.

Earle was playing with some friends and started to run with an open knife in his hand. He tripped and put out his hand to break the force of the fall, with the result that he fell on the knife blade, which entered his abdomen. He was carried home, the doctor was called, and the wound was found to be so bad that the boy was taken to a hospital. It was stated in the paper that there was some hope of Earle's recovery.

Some of these accidents are truly dreadful. One little boy four years old fell on a stick he had in his mouth, and it was driven through the back of his throat. He became paralyzed and died. This is a case showing how older brothers and sisters need to have watchful eyes.

"A three-year-old boy, Roy Wolf, was playing with a sharp stick in one hand Monday afternoon, when he fell down and struck on the stick so that it entered one nostril and ran through and out of the side of the nose, just missing one of his eyes."

Here are two accounts of children falling on scissors.

"While William Snow, aged four years, was playing with a pair of scissors, he fell and they entered his

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forehead, cutting a gash four inches long. The child was taken to the hospital for treatment."



A PIECE OF FLANNEL
AND A BOWL OF HOT
WATER

pointed scissors, blunt scissors, and careful mothers see to it that their children have only this kind.

BRUISES

When the skin is broken the bruise should be cleaned carefully with an antiseptic solution, being careful that every particle of dirt is taken off, and then a piece of cotton or cloth wet in the solution should be laid over it and bandaged.

"While Ruby Strong, ten years old, was playing with a pair of scissors, she cut an artery in her right arm and nearly bled to death before the seriousness of the accident was realized."

Children love to cut with both scissors and knives. There are two precautions to which children and grown people should pay attention: first, never go about with an open knife; second, never give a small child

In kindergartens they always use the



WRINGING THE FLANNEL INSIDE
OF A TOWEL

When the skin is not broken it is well to apply cloths wrung out in hot water. This tends to keep the blood in circulation.

Notice in the picture the method of wringing cloths from hot water. Flannel holds heat better than cotton. Take a piece of flannel and dip it into the boiling water; then place it in the towel, and twist the ends of the towel in opposite directions. In this way you can get the cloth quite free from water without burning the hands.

CHAPTER VIII

HOW WOUNDS HEAL

In the care of all wounds the first essential is to get them clean. No matter how clean a foot or a hand might seem to a boy, the doctor would probably call it very unclean. Even a thorough washing with soap and water will not cleanse the hands sufficiently to satisfy him. I have seen a doctor scrub his hands with a brush and soap and hot water for at least ten minutes, and even then he did not consider them clean enough to touch a wound.

As you learned in *Good Health*, there are microbes in the soil, in the air, and in the water, although we cannot see them. If we wish wounds to heal quickly, we must be certain that no poisonous microbes find a home in them. Microbes are sure to enter whenever a wound is made, but we can destroy them before they do any harm. They can be killed by various chemicals called antiseptics, and that is why the doctor, after his soap-and-water scrubbing, washes his hands in a microbe-killing solution before he touches a wound, which is also carefully cleansed with one of these solutions.

Many wounds heal, as you know, without an antiseptic cleaning; but after years of practice, all doctors are now

more and more careful to clean wounds before bandaging them. The least particle of dirt is certain to give trouble, and the smallest opening is large enough for microbes to get in.

Bichloride of mercury is one of the best antiseptics known. It comes in tablets which can be bought at any drug store, and a five-grain tablet dissolved in a quart of warm water makes one of the best germ killers. Carbolic acid is also a good antiseptic, and a useful solution is made by adding a teaspoonful of the acid to a pint of hot water. Both of these drugs are very poisonous and must not be left around where little children can get at them.

Boracic acid, another good antiseptic, is prepared by dissolving a teaspoonful of boracic-acid powder in a pint of hot water. It is difficult to dissolve it in cold water.

A wound thoroughly washed in clean water that has been boiled and then in one of these antiseptic solutions is ready to be bandaged.

You have doubtless noticed how differently slight scratches will heal at different times. Sometimes a dark brown scab will quickly form, and in a few days it will dry up and either fall off of itself or be picked off. At other times inflammation sets in, pus forms, and the scratch remains sore for a long while. The second scratch may not have been any more severe than the first; the trouble is that harmful microbes have entered the wound. It is wise to take care of even the slightest scratch.

A wound that heals in the first way, without becoming inflamed, is said to be healed by "first intention." When it becomes inflamed and pus forms before it heals, we speak of it as healing by "second intention." The aim should always be to get wounds to heal by first intention. First intention wounds heal much more quickly, give less pain, and leave much smaller scars than second intention wounds.

It is easy and simple to keep on hand a bottle of boracic-acid solution, and whenever one gets a cut or wound of any kind, to wash it carefully with some of this fluid. It is a good eye wash if the eyelids become slightly inflamed. It can do no harm, and it may do good. Oculists prescribe it for inflamed eyelids.

I know a man who once had a small pimple on the back of his neck, and he kept picking at it until it became infected; then a terrible carbuncle developed. He had to go to a hospital, and the doctors said that without the best of care, he would have died from blood poisoning. If these dangerous microbes had not been allowed to secure a foothold, if he had had the little pimple properly taken care of at first, he might have been saved all that suffering.

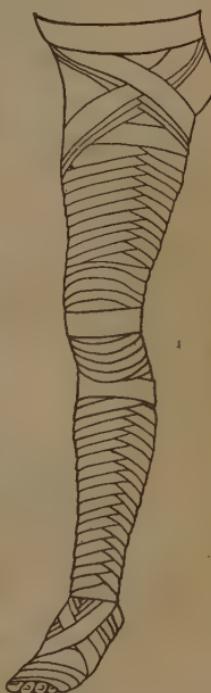
It often takes more wisdom and courage to be careful of wounds than to let them go untended. Sometimes people—boys especially—are ashamed to have little wounds dressed. They think it looks babyish. But common sense tells us that it is not so.

CHAPTER IX

BANDAGES

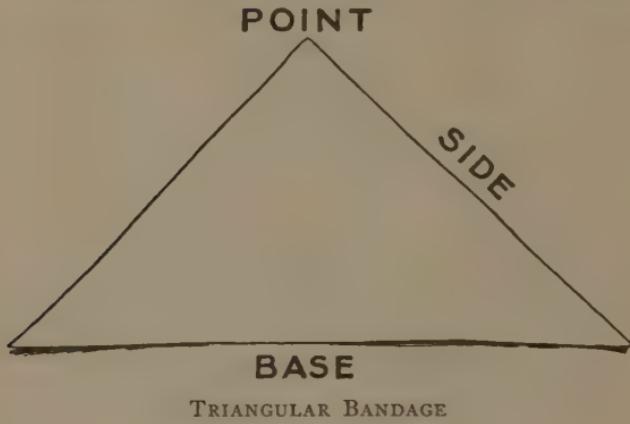
There are two distinct kinds of bandages,—the "roller" bandage and the "triangular" bandage. To learn to use the roller bandage well takes a great deal of time, and, even then, constant practice is necessary. The triangular bandage is being used more and more even in hospitals, and for emergency cases is altogether sufficient. It is much better than a poorly adjusted roller bandage. A roller bandage perfectly made is very pretty (see picture).

The triangular bandage is made by cutting diagonally a square of white cloth. One square makes two bandages. The size of the triangle depends on where you want to use it, and varies usually from eighteen to forty inches on the base line. This bandage is especially good for emergencies, for it can be made from a handkerchief (it is not necessary to cut the handkerchief), or from a piece of skirt, or from a shirt. It is a good plan to keep on hand for emergencies



ROLLER BANDAGE

several yards of white cheese cloth. This costs only four cents a yard, is soft, and can be made antiseptic by baking it in the oven or by boiling it. One can easily learn



to use it, and it can be folded so as to be wide or narrow according to the place where it is needed.

Every one should know how to make what is called a "square" knot. There are three reasons why this is



SQUARE KNOT



GRANNY KNOT

better than a "granny" knot: it does not slip; it makes a flatter knot and so is more comfortable; it is neater. Study the pictures. By taking a little care every time

you make a knot you will soon have the "square" knot habit and will never make another "granny" knot.

There are some people who judge your character by the knot you make. Notice how careful clerks are about this. A careful employer does not want a clerk who makes a knot that will slip. The following are some of the ways of using the triangular bandage.

THE SLING

The triangular bandage can be used for a sling to hold a broken arm or a hand that has been badly hurt and which must be kept still. The pictures show how this is done.



SQUARE
KNOT



GRANNY KNOT

THE SCALP BANDAGE

Place the base of the triangle across the forehead, bring the ends of the base around to the front, and tie with a square knot. The point is then drawn to fit the scalp comfortably, and pinned with a safety pin. Girls can use such bandages for bathing caps. You can see how they are made by examining the pictures on the next page.

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SLING



HAND BANDAGE AND SLING



SCALP BANDAGE (SIDE VIEW)



SCALP BANDAGE

THE HAND BANDAGE

This bandage is to be used in case of injury to the palm of the hand. Fold the bandage the desired width; then lay the middle of the bandage over the palm, bring the ends around back of the hand, cross them over, and bring them up and around the wrist, as shown in the figure.



HAND BANDAGE

THE FOOT BANDAGE

The base of the triangle is placed back of the heel; the point is pulled out in front of the toes and then

brought over above the ankle. The ends are then crossed over the ankle, and taken back behind the heel, crossed again, and finally brought forward and tied above the instep (see figure).



FOOT BANDAGE

THE BANDAGE FOR THE EAR

Fold the bandage twice. The middle of the bandage is placed on the uninjured ear; then the head is bound just as you would tie up a package. The picture on the next page shows how this bandage is made.

THE BANDAGE FOR THE EYE

Place the middle of the bandage over the injured eye; then take the ends behind the head, cross them, bring them forward again, and tie over the eye.

BANDAGE FOR A FINGER OR TOE

Make a small triangle, the base of which measures seven inches. Fold twice. Place the middle of the band-



EAR BANDAGE



EYE BANDAGE

age over the cut, bring the ends around back and cross, then bring them over the cut again and tie with the square knot. Soft linen or cheese cloth are best for these little bandages. They stretch and yet fit snugly on the finger.

It is a good plan to learn how to use surgeon's plaster. You can buy it in ten-cent rolls at any drug store. When you have a sore on the knee or leg or any place where the bandage is likely to slide down, you can

place a little piece of cloth over the sore and strap it on with this plaster (see picture); or if you put a roller bandage on a sore finger, you can hold it in place with surgeon's plaster much better than with a string.

It is well to practice putting on these bandages. Baby brothers or sisters might not object if you should experiment on them. Even your mother might not mind it. If you have no brothers or sisters, you might bandage the cat's legs.

TO THE TEACHER. Almost the only way to fix this subject-matter in the minds of the children is to have them apply the bandages in the class room. Some cheese cloth cut in the right lengths is all that is necessary for bandaging, and for practicing the "square" knot, which should be practiced until the making of it becomes automatic. The "square" knot habit is thoroughly worth while. It points toward efficiency. The children can practice the turns at any time with their handkerchiefs.



HOW TO USE SURGEON'S PLASTER

CHAPTER X

WHAT THE CITY DOES FOR PEOPLE IN CASE OF ACCIDENT

When accidents occur, children living in the city are more fortunate than those living in the country, for the city has hospitals (see picture) with good doctors and nurses to take care of the unfortunate ones who are injured.

If a child is accidentally run over in the street, some one should go immediately to the nearest telephone and call up the police. (No charge is made for the use of the telephone in calling the police in cases of accident or in cases of fire.) The police inform the nearest hospital, and the hospital has an ambulance ready which it sends immediately to the child.

In the hospital everything is prepared to receive the wounded child as soon as the ambulance returns. The doctors, the nurses, the bandages, hot and cold water, and antiseptics to destroy harmful microbes,—all are ready when the ambulance arrives.

According to a report made by the New York State Charities Aid Association, New York had, in 1908, one hundred and sixty public and private hospitals. During

the year, two hundred thousand people were cared for in these hospitals. It cost New York six and a half million dollars to provide this service for its people.

The public hospitals and ambulances are for the use of the rich and poor alike, although, if able, one is expected



FORDHAM HOSPITAL, NEW YORK CITY

to pay for hospital services, as the city cannot afford to take care of those able to take care of themselves.

I have been to some of the hospitals and have seen some of the emergency cases as they came in. One day I saw a boy come with the end of his finger smashed. It had caught in some machinery in a factory. The bone stuck out at the end. The doctors injected some

substance into the finger to relieve the pain. Then they cleaned it thoroughly, sawed off the end of the bone, and brought the flesh up over the end of the finger and secured it there with several stitches. If the boy had not had this treatment, in all probability he would have lost



CHILDREN'S WARD, FORDHAM HOSPITAL

his whole finger, and possibly his hand. It would have been impossible to give this treatment at home. If the bone had not been cut off, the flesh that remained would not have healed over the bone. Too much of the flesh had been torn away, and the result would have been that the wound would not have healed until the bone had come off by itself, possibly at the joint; and by that

time microbes would have gotten into the wound, so that it would have taken it a long time to heal.

A wound cared for in this way heals quickly,—within eleven days,—while such a wound, *if neglected*, takes weeks or even months before it can possibly heal. So this boy, by having his finger attended to immediately, saved himself long-continued pain and weeks of time.

The same day that this boy came into the hospital a man came in with a deep, punctured wound in the palm of his hand. He had delayed nearly a week after the accident before going to the hospital. The doctor in examining the wound found a piece of glass and something that looked like coal. The man suffered much more than the boy did, and much more than he would have suffered had he gone to the hospital as soon as the accident happened. His whole hand was swollen, and I wondered if the doctor would be able to save it at all. The doctor cleaned the wound as well as he could, but the microbes had already begun their harmful work. A wound cared for immediately is bad enough, but it is many times worse when it has been left until inflammation sets in.

It is impossible to get the exact figures in regard to the causes of accident. When an ambulance physician reports his case at the hospital, he writes down what the accident was, not the cause. For instance, a man breaks his leg. He may have been drunk, or only slightly under

the influence of liquor. The doctor writes down the case as a broken leg. The police, too, report the case at headquarters as a broken leg. No mention is made that the man was drunk, and that he fell on the ice and broke his leg because he had taken something that made his mind refuse to guide his legs correctly.

Not being able to get exact figures, I have asked a number of doctors who have served on ambulances how many cases they thought were due to the use of alcoholic liquors. One doctor who has served for years at the head of an emergency hospital in Boston said that at least one half of the cases were due to drink. Another doctor said that he thought fully ninety cases out of a hundred were directly or indirectly caused by drink. A nurse made the same statement.

In order to understand the difference between a direct and indirect cause, consider the case of the broken leg. The direct cause of the accident was that the man slipped on the ice; the indirect cause was that he had taken several glasses of whisky and was not able to walk straight, so that he slipped on the ice and broke his leg. This shows that many cases which are really due to drink are not so reported, and we cannot get the facts on the effect of alcohol on accidents.

The mechanism of our bodies is much more complex and wonderful than that of any machinery made. Look into a watch and see how perfectly and wonderfully the

wheels go round. But the least disturbance of that machinery will make the watch useless. Alcohol disturbs the machinery of the body. A little alcohol does not disturb the machinery of the body enough to make it useless, but it may disturb the delicate adjustment of the mind to the body enough so as to cause one to hesitate in crossing a street, and this may result in his being run over. Or if a man is working with machinery, alcohol may be the cause of a slip at a critical moment, resulting in the loss of a hand or a foot.

This is why people who have work to do that requires delicate adjustment should not drink. It is the reason why men who drink are not given responsible positions. All over the world people are recognizing the bad effect that alcohol has on the body. There is a great movement going on against it. Therefore people who want to live long and want always to have control over their minds and bodies should not drink. They should refuse to take that which is likely to put the machinery of their bodies out of order.

CHAPTER XI

BURNS

As two sisters went to bed one night one of them, as she turned out the light, dropped her watch, which she was in the habit of keeping every night on a chair beside her bed. She struck a match too near her nightgown, which was new and made of flannelette, and in an instant the soft fuzz of the flannel was in flames. She gave a scream and ran down the stairs to her mother, who quickly grasped the nightgown at the bottom and, rolling it together, pulled it off over her head. Very fortunately the little girl was not burned. Her sister tried to help, but was so excited that she only succeeded in throwing a rug down the stairs after her. She had the right idea, but she was not quick enough.

Both of these girls *knew what to do*, but they lost their heads. What the one on fire should have done was to lie down on the floor and roll over and over; then her sister could have helped her by wrapping a rug or woolen blanket about her. Fire, like people, cannot live without air. The rug would have shut out the air and so have smothered the fire. But right here one caution should be noted. The blanket should be wrapped *from*

the head *toward* the feet, otherwise the flames would be forced out directly toward the face.

Flames always go up, not down. If the girl had lain down on the floor, the flames could not have climbed so



THE BLANKET SHOULD BE WRAPPED FROM THE HEAD TOWARD THE FOOT

far, and, still more important, they would not have been going towards her face.

Fire spreads sideways and even downwards, but very slowly as compared to its flight upwards. This girl ought

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Fire spreads sideways and even downwards, but very slowly as compared to its flight upwards. This girl ought

not to have gone downstairs. The flames were given every chance; they were even being fanned into fury, and in an instant more she would have been breathing them. It is a wonder that her face or at least her hair was not burned before she reached her mother. The girl did the worst thing possible, and it was almost a miracle that she escaped.

Flannelette catches fire very easily and has been the cause of many deaths. In the family where this accident happened the mother will never again use it for her children.

A young woman of my acquaintance knew what to do and had the presence of mind to do it. She had on a flannelette kimono which accidentally became ignited. She lay down on the floor and put the fire out almost instantly by rolling over and over.

Some manufacturers treat flannelette with a preparation which has greatly reduced its inflammability. One should ask for the flameless kind, it costs very little more. At any rate, flannelette should be washed before being worn, as washing reduces its inflammability. Cotton goods burn more readily than woolen. Careful mothers never allow their children to play around bonfires when they have on cotton dresses.

A friend told me that when she was a little girl she was playing around a bonfire, and the cotton dress which she had on took fire and was almost completely burned

off her; but she had on woolen underwear and her mother put the fire out before the wool had time to get ignited. So she was not burned.

One should be very careful in cleaning gloves or laces with gasoline to see that no fire is about. A friend of mine was badly burned through being careless about this. She was cleaning some spots from her white gloves before going out, and thoughtlessly passed near the lighted gas. Almost instantly the room was in a blaze, and her hands and arms were badly burned.

TO THE TEACHER. Take strips of cotton cloth, woolen cloth, and flannelette, each one inch wide by four inches long. With three pieces of wire make hooks and attach the pieces of cloth. Bent-wire hairpins will do. Touch with a match, and see which is the most inflammable. Similarly take two pieces of flannelette. Soak one in alum water and one in plain water. Dry thoroughly and light as in the above experiment. See which is more inflammable. In the same way take two pieces of flannelette. Ignite one at the bottom and the other at the top, and see which burns the more quickly. Draw attention to the fact that in starting a fire we light it at the bottom and not at the top.

Accidents with fire occur in various ways. During the month of March, 1908, among five hundred newspaper accounts of children who had met with accidents, I learned of ninety-two who were burned in one way or another. Thirteen of these died. Ten of the deaths were due to scalds. Twenty-nine children were burned by playing with fire. Seven of these were playing about bonfires and their clothes became ignited. Five were

playing with matches. Seven were poking sticks into stoves or grates, and six, while playing, fell against stoves or into fireplaces.

All of these children who were burned by playing with fire were six years or under in age. Most of the accidents happened to the little four-year-olds. At that age many children are bewitched to play with fire, especially with matches. Careful mothers keep matches out of reach of little children. Older brothers and sisters should help the younger ones over this learning period. To get burned is an expensive way to learn that fire burns.

Many fires could be prevented if people would always use safety matches. It is not uncommon for fires to be started by mice nibbling sulphur matches, and for this reason alone they should never be used.

CHAPTER XII

HOW BURNS ARE CARED FOR

Supposing that the little girl of whom we were speaking in the last chapter had been burned, what should the mother have done until the doctor came?

The first thing to do would have been to exclude the air from the burns. Air coming in contact with burns is what causes the intense pain. If large portions of the body are burned, there is no better way of shutting out the air than to place the patient, clothes and all, in a tub of warm water (104°F .). Small burns can be treated with cold water.

The reason why a person who has been badly burned should be put in warm water and not in cold is that the whole temperature of the body would be lowered by being immersed in cold water. This would be injurious.

If a large part of the skin on the body is red and inflamed, it means that more than the usual amount of blood is passing through the outer layers of the skin, and this in itself cools the body, especially if the air is cool. When a person has been badly burned, it is often necessary to apply artificial heat to keep up the general temperature of the body. The normal temperature of

the body is 98.6° . It is the same summer and winter. The skin is very wonderful in the way it protects the body from heat and cold. When one has a temperature of 105° , that is, 7° above normal, it is a serious matter; but it is even more dangerous to lower the temperature of the body seven degrees.

You often hear a person say when burned, "I put my hand in water, but when I took it out it hurt just as much as it did before." This shows that the thing to do is to keep it in water. I knew of a small boy whose hands were badly burned by the exploding of a torpedo firecracker on the day before the Fourth of July. The mother was a physician and knew of the water treatment. All day long she had her little boy hold his hands in a pail of cold water. At night, whenever he awoke and they pained him, he reached over and held them in the water again. The next day was the Fourth of July, and again all day he sat (this time by the window) with his hands in a pail of water and watched the other boys have their fun. The result was that both hands healed quickly and no scar can be seen.

When a doctor is called to take care of a burn, he often has to undo what has already been done. The mother or friends often treat burns with flour or ointment. The doctor is sometimes forced to remove this, and the process is very painful and even injurious. If the burn has only been in water, the doctor has a better

chance to use his skill, for he has nothing to undo. Another advantage of the water treatment is that it greatly reduces "shock."

"Shock" is due to a disturbance in the circulation of blood. This disturbance is sometimes great enough to cause death.

The advantages of the water treatment are:

1. It is easy. Water is always at hand.
2. It stops pain by shutting out air.
3. It gives the doctor when he comes a better chance to use his skill.
4. It reduces "shock," from which many die.

But there are times when the water treatment is not convenient. A person with a burned hand or finger would not want to go around with a basin of water for several days. The treatment in such cases depends on the degree of the burn.

Burns are divided according to their degree of severity: the first- or least-degree burns only cause the skin to turn red; the second-degree burns cause blisters; third-degree burns destroy the tissues of the skin.



When the skin is not broken, soft, clean cloths soaked in water, in which common cooking soda has been dissolved, should be laid carefully over the burned parts; then, to shut out the air these first bandages should be covered as completely as possible with woolen cloths or cotton batting.

The first- and second-degree burns are best treated with soda and water; but when the skin is broken, as in third-degree burns, oil is used. This should be gently poured over all the burned places, then soft cloths, soaked in oil, should be carefully laid on, and the whole covered with woolen cloths or cotton batting.

Carron oil is the best kind of oil to use. It is made of limewater and linseed oil, half and half. Mothers often keep a bottle of it in the house ready for just such an emergency. Every fire engine that goes to a fire has an emergency case, and one of the things in this case is a good-sized bottle of carron oil. Salad oil is good; Castor oil, glycerin and vaseline, and even lard or unsalted butter will do.

The seriousness of a burn depends largely on how much surface of the body is burned. If as much as two thirds of the body is burned, even to the first degree, or only enough to turn the skin red, the sufferer will probably die; yet the whole arm might be burned off, and the person live. A surprising number of burns are due to baby's grasping the coffee pot while sitting near the mother at the table.

Scalds are apt to be first-degree burns covering large portions of the body, and for this reason they are the most fatal of burns. In March, 1908, out of thirteen deaths due to burns, ten were due to scalds.

When a person is burned, his clothes should never be drawn off; they should be very carefully cut off with a pair of sharp scissors.

Blisters should not be touched for twenty-four hours; then they must be drained. A doctor told me that he found the best way to do this was by snipping the center of the blister with a pair of sharp scissors and carefully pressing the sides of the blister together; then it should be bandaged with an oil dressing. Large blisters should have the care of a physician.

Sunburn is treated in the same way as any other kind of a burn. Usually it is a first-degree burn. How often boys and girls are careless in the summer time and have to suffer for days with blistered arms and neck or legs! There is scarcely a person who has not suffered in this way at one time or another.

Too great care of burns is impossible. Look at the two pictures on the following page. The accidents to these two persons were similar. They both fell into fires. In one case the mother knew what to do until the doctor came, and the doctor knew the best treatment; in the other case the doctor attended to the healing of the wound, but did not save the hand from being crippled.

You would scarcely believe that the person whose hand is pictured on the left fell with both hands into a bonfire, so that when they had lifted her out, both hands were so frightfully burned that the muscles and skin hung from the bones. The mother covered the hands with

carron oil and wrapped them up until the doctor came. He wrapped oil dressing around each finger separately, and



THESE HANDS WERE BURNED, BUT
WERE PROPERLY CARED FOR



THIS HAND WAS BURNED AND
CRIPPLED FOREVER

for three months the girl had to be fed. The doctor had to cut the skin between the fingers several times to keep them from growing together. In the second case the doctor attended to the healing of the wound, but did not keep the hand open and the fingers separated. You can see the result.

CHAPTER XIII

FIRESES

It costs a city an immense sum of money to protect its people and their property against fire. New York expends ten million dollars every year for this protection. Besides money, it takes an army of strong, vigorous, fearless men. Each man who enters into the service of the fire department of a large city like New York has to pass a Civil-Service examination, both as to his physical and mental abilities. He is given a physical examination first, and then, if he passes in this, he is allowed to take the mental examination.

Finally, if he passes both the physical and the mental examinations, he is given a thirty days' probation time.

He must leave "drink" alone. The city knows well that it cannot afford to have firemen who take alcoholic liquors. A man under the influence of alcohol is not the man who saves our property or rescues men and women and children from the top stories of burning buildings. Only men who are in full possession of all their senses and strength are able to meet the requirements of a fireman's work. Can you imagine a man under the influence of liquor doing any brave deed?

During the thirty days' probation, the men serve on the force and at the same time attend a training school. I visited the training school in New York and saw the men learning to use the scaling ladders and to jump into the life-saving nets, which they also learn to hold for others to jump into. They practice making different kinds of knots and throwing a line over a building.

While they are getting this practical training they are told what is expected of them.

You cannot imagine a fireman under the influence of liquor twining his legs about the top round of a ladder and leaning out as far as possible to catch a woman whom he has persuaded to drop into his arms, and yet that is what one of our firemen did once. If you would like to read more on this subject, get *Fire Fighters and Their Pets*, by Alfred M. Downes. It is a very interesting book and has some good stories.

It would fill many books to begin to tell all the brave deeds of the firemen of our country. Many of these men have no reward except the consciousness of duty well done. "They risk their lives and don't talk." Hundreds of the fires in which these brave men risk their lives are caused by children playing with matches, or by careless men and boys throwing lighted cigars or cigarettes in places where they are likely to start a blaze.

In 1906 there were in New York City alone two hundred and twenty-eight fires caused by children's reckless

use of matches, and four hundred and one were caused by lighted cigars or cigarettes.

If you have discovered a fire, the first essential is cool-headedness. If it is beyond your control, give the alarm. Shut all the inside and outside doors and windows you can. This stops the draught and confines the fire to one floor or room. Shutting off draughts is much better than to try to save furniture.

Even in small fires it is best to give the alarm. A fireman told me that the fire department would not complain if its services were not needed. They would rather get there too soon than too late.

If the doors and windows are closed, there is very little danger of fire spreading much before the firemen get there. They will be able to save more household goods than you possibly could. There is great loss in pitching things out of doors and windows. The articles are often injured by the fall. They may be trampled upon or stolen, or they may be soaked with water. The fire department has a salvage corps, whose duty it is to save everything possible. They have had experience, are strong, and have the necessary things with which to work. Many fires nowadays are put out with chemicals. In such cases it is not necessary to move anything.

Not infrequently a fire gets started down in the hold of a ship when it is far out on the ocean. What does the captain do? He does not let his passengers get excited

if he can prevent it. He orders the crew to shut off from the rest of the ship the compartment where the fire is, thus preventing a draught of air from getting to the fire. A few days ago I read this heading in a newspaper,— "Ship Afire Four Days." The ship finally reached land. Its cargo was damaged, but the ship and the people on it were saved. It would have been impossible to save the ship if air had been allowed to fan the flames. Fire soon exhausts the oxygen that is in a room, and there can be no fire without oxygen.

CHAPTER XIV

EYE TROUBLES

In this country, a hundred years ago, boys and girls went to school only about three months during the winter. They had to help their parents in the work of the farm and the home during the rest of the year. There were very few libraries, and they were not for the use of children. Very little time comparatively was given to books.

Now all this has changed. The eye is taxed as it never was in all the ages past. Children, while they are growing, spend most of their time when they are awake with books. For many hours each day the eyes are focused on a page of printed matter. Sometimes the print is good, sometimes not.

This is a terrible strain on the eyesight, as is shown by the examinations of the eyes of school children. There are twice as many children who have eye troubles at sixteen as at eight years of age (see *Medical Inspection of Schools*, by Gulick and Ayres).

A great deal of this strain on the eyes is given unnecessarily. Both boys and girls know how a book should be held while reading, but often they do not

think it is worth while to bother about it. Each time it seems too much trouble to move. You can read the page with a dim light, and so you do not bother to get a good light. Perhaps, too, you sit incorrectly with the light in your eyes and a shadow on your book.



THE LIGHT COMES OVER THE LEFT
SHOULDER

Children are constantly reminded by their parents and friends about this matter, but it does not seem to correct the trouble. A good plan is to find out for yourself by experiment just where you can read or study to the best advantage. Try different positions in the rooms where you read and study. Sit with your face to the light and then with your back to the light; then sit with your right side

towards the light and then with your left side towards the light. See in which position you can read most easily. You will probably find that if you sit so that the light comes from the back over your left shoulder, you are in the best position. After you have once done this carefully for each room, it is decided for all future times. You will not have to stop and think about it again.

A habit of correct sitting while reading can be permanently formed in this way. The habit is worth while for another reason, too, for many ills, such as headaches, dizziness, and nervousness of various kinds, are brought on by eye troubles. Prevention is much better than cure. Taking care is much better than wearing glasses.

The eyes are wonderfully protected from accidents. They are set back in a strong, bony cavity. The eyelids, edged with thick hairs, keep out dust and insects; and the tears usually wash away whatever dust sifts through.

THINGS IN THE EYE

When a cinder or insect or particle of dust gets into your eye do not rub it, no matter how much you feel that you must. Rubbing will probably push whatever is there still more firmly into the eye. Rubbing the other eye often assists the flow of tears and helps wash out the particle.

A common way and a good one of removing a small particle such as a cinder is to moisten a corner of your handkerchief and let a friend wipe the particle off.



A GOOD POSITION

Most particles can be taken out by this means without further trouble. I always prefer, if possible, to take the troublesome thing out myself. To stand by a mirror and find it myself is much easier for me than trusting some one else to do it. It does not seem to hurt so much.



LOOKING FOR THE CINDER

It is a good plan to close the eyes for a few minutes until the flow of tears gets well started. If the tears have not washed the thing out, try taking hold of the eyelashes of the upper lid and bringing it out and down over the lower lid. Often the particle will be left on the lower lid. Sneezing or blowing the nose sometimes assists its coming away. Try holding the

upper lid away from the eye and rolling the eyeball up and down and from one side to the other.

If none of these ways is successful, sit down in a chair, let a friend stand behind you, and press your head firmly against his chest. Then let him take hold of the eyelashes and turn the lid back. In this way the surface of the upper lid is exposed, so that whatever is lodged there can be easily wiped off with a piece of soft, wet cloth.

After the particle is removed, the eye often feels as if it were still there; but this feeling soon passes away. If it remains for a long time, an oculist should be consulted.

A little girl while playing at a neighbor's had her left eye seriously burned by mortar, which fell into the eye as she was gazing up at the house. In a case of this kind wash the eye with water to which a little vinegar has been added. The acid of the vinegar will neutralize the alkali of the lime in the mortar.

BLACK EYE

A boy came into my home a few days ago with a black eye. He had been playing football. If he had been at home and had bathed his eye with hot water, he could have scattered much of the blood which caused the dark color (see p. 35). Hot water would have kept the blood circulating so that the extra blood would have been carried off. If you want to hasten the cure of a black eye, it is a good plan to rub it gently. This massage aids the circulation and so helps to carry off the extra blood.

Whenever the eyelids are glued together in the morning, it shows that there is some trouble which needs attention. Whenever the eyelids twitch or feel queer in any way, there is some trouble. Washing the eye with boracic acid, as described on page 38, can do no harm and may very likely be all that is needed.

CHAPTER XV

TOOTHACHE AND ACCIDENTS TO THE TEETH

A friend of mine had his two upper front teeth knocked out when he was a boy. They were not his "baby" teeth, but the strong, permanent ones. He was frightened and feared a scolding from his mother; so he pushed them right back into their places again, and there they are to this day! He is a man forty-five years old. I wrote him to be certain that I had the facts exactly right, and he said in his letter, "I stuck them back and I still have them, although they are discolored because of the death of the nerves."

My dentist told me of another case. A boy playing baseball was hit on the mouth by the bat, knocking out one tooth and loosening another. He went to the dentist to see what could be done with the loosened tooth. The dentist told him that if he had brought the one which had been knocked out, it could have been replaced. It was dark, but the boy took a lantern and went to the baseball field and looked about until he found his tooth; then he took it to the dentist, who put it back in its place.

The dentist has several methods of doing this. Most frequently he bridges the loosened tooth to the sound

tooth or teeth beside it. At other times he ties it into place. Even though the gum is lacerated, loosened teeth can often be fastened into their places again.

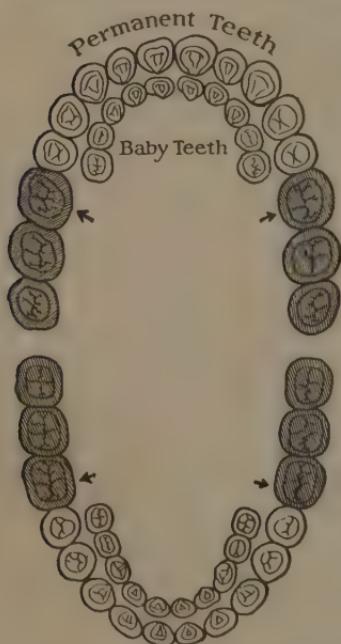
This is worth remembering. You can have your teeth replaced if they get knocked out, but you must attend to the matter immediately or it will be too late. If a piece of tooth is broken off, the dentist can patch it up.

If you take perfect care of the teeth, you will not be troubled by toothache. But few of us escape it altogether, and when a toothache comes it is well to know what to do for it.

If there is a hole in the tooth, twist some clean cotton around the point of a wooden toothpick and use it to clean the hole. Then take another piece of cotton, dip it into oil of cloves, and push it gently into the cavity. This will stop almost any toothache which is caused by a cavity. Salt or baking soda used in the same way will sometimes stop the pain. Drop a little into the cavity.

Where there is no cavity, it is more difficult to know what to do. The old way was to hold something hot against the cheek. Bags of heated salt were sometimes used; at other times hot cloths or a hot-water bottle. This is all right if the tooth is alive, but if the tooth is dead and sore to the touch, heat is not the best treatment, unless we want the gum to ulcerate and the inflammation to come to a head. Sometimes this is necessary, but in most cases it is desirable not to allow

the inflammation to form, and to prevent this there is nothing so good as a piece of ice held against the cheek. This often stops the pain and prevents further trouble. Many people do not know of this ice treatment. They



THE FOUR ARROWS POINT TO
PERMANENT TEETH, WHICH
COME AT THE AGE OF SIX

imagine that ice would cause pain and do harm; but you will find that modern dentists will tell you to use it in such a case as we have described. For the same reason doctors order an ice bag for a quinsy sore throat or for an abscess, so as not to allow inflammation to form.

There is one thing every child ought to know about his teeth. At the age of six years four of the largest teeth make their appearance. These are permanent teeth,—two on each jaw. The arrows will show you their exact location. These teeth run a serious danger from the fact that

they grow right in among the baby teeth. Baby teeth are almost sure to be more or less decayed, and this decay may spread to the four new teeth, which ought to last for a lifetime. They are valuable grinders, and we cannot afford to have any harm come to them. Watch

them carefully. Do not let a decayed spot appear; if it does appear, go at once to a dentist. Do not wait until you have a toothache.

The Germans have a saying, "Healthy teeth, healthy stomach, healthy body."

Dr. Osler, one of the best known doctors in the world, says that there is nothing so important for good health as the proper care of the teeth. Decayed teeth have all kinds of microbes clustering about them ready to make trouble.

I know a young woman who had a most desirable place as a stenographer, but her employer dismissed her because her breath was bad. Her bad breath was due to poor, decayed teeth.

In many cities of our country, leaflets about the importance of the care of the teeth are distributed in order to get people to pay more attention to this subject. Boston distributed one called *Care and Use of the Teeth*, which is worth studying (see next page).

There is one exception that some dentists would make to these rules, and that is that brushing the teeth once a day is enough, although it is well to rinse out the mouth after eating so that particles of food will not be left about the teeth. But here again is an exception, because people are not all alike; some need to brush their teeth more frequently than others.

Some dentists make contracts with people to take care of their teeth by the year.

I have a friend who sends her children on a given day every month to have their teeth examined and cleaned. The result is that these children have no cavities in their teeth, and tartar is never allowed to form on them.

What are the teeth for?

Not merely for ornament. Their chief use is to prepare the food for the stomach — to grind the food and mix it with saliva. Food which is not thoroughly chewed causes indigestion and constipation.

How long should the teeth last?

To the end of life.

How do we lose them?

By decay and loosening.

What causes teeth to decay?

Bits of food and candy sticking to the teeth; also a poor physical condition.

Where does the food lodge?

All along the edge of the gums between the teeth, and in the crevices of the grinding surfaces.

Can decay be prevented?

Yes, to a large extent.

How can decay be prevented?

By scrubbing the teeth thoroughly with a toothbrush, tooth powder and water; and by keeping up the general health.

How often should the teeth be cleaned?

At least twice a day — after breakfast and at bedtime. Better after each meal.

Should the gums be brushed?

Yes. Moderate friction helps to keep them healthy.

How often should tooth powder be used?

At least once a day — at bedtime.

Twice a year, at least, a Dentist should carefully examine the teeth.

A bad condition of the throat, the nose, and the ears is made worse by decayed teeth. They add to the chances of catching infectious diseases. Well-cared-for teeth and a clean mouth help prevent TUBERCULOSIS.

Cleanliness is the best guard against disease.

CHAPTER XVI

ACCIDENTS TO THE NOSE

I once knew a little boy who began to talk through his nose, and as time went on the trouble grew worse and worse. We did not know what was the matter with him. He didn't seem to have a cold. Finally we took him to a doctor, who found in his nose a bean, which had swollen and begun to sprout. The larger it became, the more trouble it gave him.

Little children often push things up their noses,—beans, peas, shoe buttons, and sometimes little pebbles. I once heard of a little girl who pushed a bean up her nose. Her mother tried to get it out but failed, and finally took the child to a doctor, but the doctor could n't get it out. When they got home the little girl's grandmother made her sneeze by scattering a few grains of pepper in the air. Instantly the bean flew out. This is a harmless remedy and should be tried before going to the doctor. Tickling the nose with a feather or a piece of thread is less irritating than pepper and can be easily tried.

It is bad to try to push an object of any kind out of the nose, for the more you push and probe the further back the obstacle will go. Try holding one nostril and

blowing through the other. A slap on the back will often be sufficient. My own little girl once shoved a shoe button up her nose. I could not get hold of it and was afraid to try very much for fear of hurting the delicate lining of the nose and pushing the button further up, so I took her to our doctor. He had no trouble finding it. A little mirror strapped on his forehead reflected the light far up into the nostril, and he could easily see the button. Then with a pair of nippers he drew it out at once.

The nose has been called the "sanitary scout." When you come into a room where gas has been escaping your nose instantly tells you of it. If there is the least bit of odor of smoke, we go sniffing around through every room to find out what is the cause of it. Whenever we become aware of any strange odor around, the nose tells us to go and investigate. Many people have been saved from death by this "scout." Illuminating gas, coal gas, and smoke are all detected by the nose, unless we are asleep or have bad colds. Some dangerous gases have no odor, or very little. Among my newspaper accounts was one of a boy of fourteen years who, while playing, dropped his ball into a sewer pipe. He struck a match to find it, and an explosion resulted which knocked him down and made him unconscious for several hours. It is wise to be careful about making investigations with lighted matches.

NOSEBLEEDING

If your nose is bleeding, sit as illustrated in the picture, with the head erect. It is bad to lean over a basin. A boy who stands on his head knows how the blood rushes down into it until it is so uncomfortable that he can't stay in that position any longer. If you want your hands to look pale, hold them over your head for a few minutes. They become pale because less blood flows up into them. It is for this reason that you want to keep a bleeding head erect, and for the same reason if your foot is cut and bleeding, you should lie down and support the foot higher than the rest of the body. It will check the flow of blood somewhat.

Blood becomes thick when it comes in contact with air. Doctors call this thickening "coagulation" of blood. Cold water and ice help to coagulate blood. For this reason when the nose is bleeding it is well to put ice or something cold on the back of the neck and over the



KEEP THE HEAD ERECT

bridge of the nose to cool the blood. This is most easily done by using two towels. Place one of them around the neck, having cracked ice in a fold where it will come against the back of the neck. Put the other around the head, having the ice come on the forehead and on the bridge of the nose. Pressure will often check the bleeding. Pinch the nostrils together. The blood is held back until enough has thickened to stop up the opening. A teaspoonful of alum in a cup of water, or some vinegar in water, or tannin helps to coagulate blood. Putting the feet into hot water is good treatment. The hot water dilates the blood vessels of the legs and feet and so keeps more blood there, consequently there is less in the head.

If the nose continues to bleed a long time, it may be necessary to plug up the nostril with cotton. A good way is to take a piece of cotton as large as the end of one's thumb, tie a piece of thread around it and soak it in alum water or strong tea, and then twist it up gently into the bleeding nostril. The thread is there to help pull it out later. When the bleeding has stopped, this must be done very gently or the bleeding will begin again. A piece of clean linen will do, leaving an end with which to withdraw it.

It is most important to keep quiet. The more you move, the faster the heart beats and thus more blood is kept running through the arteries and veins.

Do not blow the nose or cough if you can help it. One should not blow the nose for some time after the bleeding stops.

Nosebleeding is not usually dangerous.

Children often have a disagreeable way of picking their noses, which is apt to cause bleeding. A blow sometimes causes it.

Children who have nosebleed are usually those who are much of the time indoors. If one is subject to it, a good remedy is plenty of outdoor exercise.

CHAPTER XVII

POISONS

There are no kinds of accidents where the knowledge of what to do and the ability to act promptly are more important than in cases of poisoning.

Always call a doctor.

Until the doctor comes it is safe to give an emetic,—something which will make the stomach "throw up" its contents. Make the patient drink cupfuls of mustard and warm water (one tablespoonful of mustard to a quart of water) or salt and water. He must keep drinking it until he vomits.

Do not wait to send to the store for mustard. Do not even hunt for the salt if it is not right at hand. Every second is precious. *Warm water alone will do.* Do not wait even to warm the water. Give cold water until some water has been warmed. Remember that you must hurry. A life may depend upon it. After ten minutes repeat the process, so as to be certain that the poison is all out of the stomach.

There are two exceptions to this rule, and these are in cases of acid or alkaline poisoning. When you put some soda, which is an alkaline substance, into some vinegar,

which contains an acid, the vinegar begins to froth and soon loses all its sour taste. It is neutralized. The same thing happens in the stomach of a person who has swallowed a poisonous acid if we give him some kind of an alkali, or if he has swallowed some poisonous alkali and we give him an acid. When the two become rightly balanced they become neutral. In general, as soon as an acid, even the most deadly, has become neutralized by an alkali it becomes comparatively harmless. But a purgative should promptly be taken to flush out the intestines and thus rid the system of the mixture. A good dose of castor oil is effective.

As both acids and alkalis hurt the inside of the stomach, it is necessary for the patient, after taking the antidote, to swallow some substance such as milk, white of eggs, oil, or flour and water mixed together.

It is always safe to give whites of eggs in case of any kind of poisoning. Stir the white of four eggs into a quart of water, and make the person drink as much as he can. There are some exceptions to the use of milk or oils.

In the case of acid poisoning it is well to breathe the fumes of ammonia. This will tend to neutralize any of the acid which may have gotten into the air passages of nose or windpipe. Never place the bottle itself to the nose of the patient, always put the ammonia on a handkerchief or a piece of cloth. Only enough should be used to relieve the patient.

Almost all poison accidents happen to children between two and four years of age. Most of these accidents could be prevented if people were more careful to keep poisons out of the reach of little children. All poisons should be carefully labeled and kept apart from other bottles. Some people stick pins through the corks of bottles that have poisons in them, but even with such precautions it is safer to look carefully at the label before taking anything from a bottle.

I know of a case which happened to be amusing rather than harmful. A friend got up in the night to put some cold cream on her face and, finding what she thought was the cold-cream jar, carefully rubbed a lot of it in. The next morning she discovered that it was black shoe paste that she had used.

If, when a person is poisoned, the hands and feet become cold, the lips turn blue, and cold perspiration stands out on the forehead, the patient should be put to bed and warmly covered up. Hot-water bottles should be used freely. At this stage it is well to give a cup of strong tea or coffee.

A nine-months-old baby who was just learning to creep saw one day a pretty piece of red paper on the floor. It attracted her eye and she managed to creep to it and, just as all babies do, put it into her mouth. Her mother was busy and did not see what the baby had done, but after a while she noticed that the baby was

deadly white, and soon the little one began to "throw up." She was very ill. The mother sent for the doctor. But before the doctor came the mother had discovered the cause of the trouble. She noticed tiny pieces of red paper in what the baby had vomited, and looking around found part of a red theater ticket, which showed signs of the baby's mouthing. Arsenic is used in many dyes; it was used in this case. A sufficient amount of arsenic will cause vomiting, and fortunately the baby had swallowed just the right amount. So when the doctor came he said there was nothing for him to do. Nature had provided the best treatment.

Arsenic is often used in the coloring of cheap candies. Many mothers never let their children have bright-colored candies if they can help it.

PLANTS POISONOUS TO EAT

I had a roommate in college who was certain she knew edible mushrooms from the poisonous kind. One day when we were out walking in the woods she ate what



THE DEADLY AMANITA

she thought was a good mushroom. In about half an hour she became violently ill with terrible cramps in her stomach. We called a physician and he gave her an emetic to get the poisonous substance out of her stomach and then a purgative to clean out the whole digestive tract. She was soon relieved, but for some time she was very weak.

It takes an expert to select edible mushrooms from the poisonous kinds. The only safe rule for most people is to leave them alone.

It is unsafe to eat berries you find in the woods unless you know what they are. Poke berries and holly berries are both poisonous. Six poke berries have been known to cause the death of a child. Although both of these berries are poisonous to human beings, they are good food for some of our best birds, such as the bluebirds and robins.

If some poisonous plant or berry has been eaten in the woods, where you cannot get mustard or salt or even warm water for an emetic, try putting your finger into the throat, or tickle the throat with a piece of grass or something of the kind.

Tobacco is another poisonous plant. Some boys are made violently ill the first time they try using a little of it. The body seems to get used to this poison after a while, although it has been found that boys who use it do not grow so tall as other boys. One can make the

body adapt itself to almost any poison. The treatment for tobacco poisoning is an emetic and then a dose of strong, hot tea. Keep the patient lying down.

TO THE TEACHER. A small bottle of vinegar and a little cooking soda can be easily obtained. One can explain to the children that vinegar is an acid and soda an alkali. By putting some of the vinegar into a glass and adding a little soda, the children can see the process of neutralization going on. Explain to them that when a person has taken a poisonous acid into his stomach and we give the person an alkali that the same neutralization takes place. Have the children taste the vinegar and the soda before and after they are mixed. Get them to make lists of all the acids and alkalis they know.

CHAPTER XVIII

POISONS — TREATMENT AND ANTIDOTES

Here are a few cases which illustrate the varied poison accidents constantly happening to very little children.

PHOSPHORUS MATCHES

A little three-year-old girl was suddenly taken ill. She had sucked the heads off some matches and was poisoned by the phosphorus. The doctors did all they could for her but she died in a few hours. It is common for little children to want to suck matches. Matches are doubly dangerous for this reason and also because of fire. Too much cannot be said about keeping them out of reach of the small children. Safety matches are therefore the best to use, for there is no phosphorus in them. Phosphorus poisoning is not uncommon among people who work in match factories.

Treatment. The treatment for phosphorus poisoning is an emetic to get the phosphorus out of the stomach; then the white of an egg to coat the inside of the stomach with something soothing; and then later a purgative to clean out the digestive track. Epsom salts is better than castor oil for this case.

RAT POISON, ARSENIC, PARIS GREEN

A baby a year old crept behind the stove and ate some rat biscuit which the father had placed there. The mother did not notice at the time what the child was doing, but soon discovered that the baby was violently ill. She gave the baby an emetic, and when the doctor came the danger was over. Arsenic is usually the poison that is used in rat poison.

Treatment. Emetic, milk or white of eggs.

TURPENTINE

A little two-year-old child drank some turpentine which the painters had left in the house. It was quickly discovered and the doctors saved the child's life.

Treatment. Emetic, milk or white of eggs.

IODINE

A child three years old got hold of a bottle of iodine and was made violently ill. A neighbor gave the child an emetic of warm water and mustard, so that the iodine was quickly removed from the stomach.

Treatment. Emetic, starch mixed in water; later, whites of eggs beaten up in milk.

STRYCHNINE

Another child two years old gave her six-months-old baby brother some strychnine pills. The little girl had

seen her mother give the baby other medicine, and she thought that she would try a little doctoring herself. The mother soon discovered what was happening and gave the child an emetic.

Treatment. Emetic, strong tea, artificial respiration.

GASOLINE

Another three-year-old child was made dangerously ill by drinking some gasoline. She found the can containing the gasoline on a piazza and drank it from the spout of the can. The child's life was saved by an emetic.

Treatment. Emetic.

Among little children the acid accidents are apt to be caused by spilling the acid and so being burned. They do not often drink an acid.

CARBOLIC-ACID BURNS

An eighteen-months-old child emptied a bottle of carbolic acid over its body. The child was terribly burned. It had succeeded in getting the bottle from a shelf; then it loosened the cork, spilling the acid over its neck and shoulders and chest.

Treatment. Wash the skin with water; deluge it with water; then wash it in soapsuds or in water in which some cooking soda is dissolved. After that the burn should be treated as a third-degree burn. Alcohol is also good for carbolic-acid burns if it is applied immediately.

CARBOLIC-ACID POISONING

Treatment. Do not wait. Make the person drink as much water as possible. Get some one else to get some limewater or magnesia, or take some plaster from the wall and dissolve it in water and give it as soon as possible. For poisoning with carbolic acid do not give fats or oils of any kind as they help in absorbing this poison. Give Epsom salts for a purgative. White of eggs is good for the lining of the stomach.

CAMPHOR

A little child I know began chewing a camphor ball, but the mother discovered it before enough was taken to do any harm. Camphor balls are often about the house, and should be guarded from little children.

Treatment. Emetic, coffee.

BICHLORIDE TABLETS

Bichloride tablets are very poisonous and should be kept out of reach of little brothers and sisters.

Treatment. Emetic, white of eggs.

BLUE VITRIOL,—SULPHATE OF COPPER, LIQUID USED IN
BATTERIES

A friend of mine knew a child who was poisoned by blue vitriol. The child found a battery which supplied

the electricity for the doorbell. The blue crystals were so pretty that she took some and ate them.

Treatment. Emetic, white of eggs.

LYE

Accidents like the following are often happening. A baby was playing near by while the mother was washing the floor with water and lye. The lye was in a bowl, and when the mother's back was turned the baby grabbed the bowl and drank some of the lye. It caused intense pain, but the doctor said the child had taken so little that it would live. He gave the child vinegar diluted in water to neutralize the alkali, and then some cream for soothing purposes.

Treatment. Dilute vinegar or lemon juice in water. Give the child all he can drink.

I could give a great many cases like these you have just read. They all show that we must be more careful to guard the little ones from danger. All poisonous things must be kept out of their reach. Older children know the dangers of drinking fluids out of bottles, so that very few accidents of this kind happen to them. The older children are more likely to have accidents like the following.

"Harry Cornell, seven years old, got hold of a can of lye by mistaking it for condensed milk. As a result of swallowing a teaspoonful of it he may die. The boy had

been very fond of condensed milk and was in the habit of taking a spoonful from a can at every opportunity. He was forbidden to do so by his mother, and last night he sought to get some without her knowing it. The room was dark and he got the lye instead of the milk. In his haste to swallow it the whole teaspoonful was in his stomach before he discovered his mistake."

LIST AND TREATMENT OF POISONS

POISON	TREATMENT
Alcohol	Emetic or stomach pump, coffee
Acids { Carbolic Hydrochloric Nitric Sulphuric}	{ Thick limewater, white of eggs. <i>(See pages 82 and 83.)</i>
Alkalis { Ammonia Lye Potash}	{ Vinegar and water, large dose of oil or milk
Ammonia	<i>See alkalis</i>
Arsenic	Emetic, milk or white of eggs
Bichloride	Emetic, white of eggs
Blue vitriol	Emetic, white of eggs
Camphor	Emetic, coffee, warmth
Chloral	Emetic, coffee, warmth
Chloroform	Fresh air, artificial respiration
Ether	{ Fresh air, prevent sleep, cold water, emetic
Gasoline	Emetic
Iodine	{ Emetic, starch and water, white of eggs
Lead Poison	Emetic, Epsom salts

LIST AND TREATMENT OF POISONS — *continued*

POISON	TREATMENT
Lye	<i>See alkalis</i>
Matches	{ Emetic, white of eggs, Epsom salts or French turpentine
Morphine	Emetic, artificial respiration
Phosphorus	<i>See matches</i>
Potash	<i>See alkalis</i>
Rat Poison	<i>See arsenic</i>
Strychnine	{ Emetic, white of eggs, strong tea, artificial respiration
Soothing sirup	<i>See morphine</i>
Sulphate of copper	<i>See blue vitriol</i>
Tobacco	Coffee, keep the patient quiet
Turpentine	Emetic, prevent sleep
Whisky	Emetic or stomach pump, coffee

CHAPTER XIX

ALCOHOL A POISON

It is not often that a child is willing to swallow enough whisky to cause death. If he had to take whisky for a medicine, he certainly would consider it very bad-tasting stuff; but children will sometimes do strange things "just for fun." Here is an instance. William Morley found a pint of whisky in his father's barn and "dared" his sister, six years old, to take some of it. She took one swallow and it made her choke. William declared that he could take it, and he drank it all. As a result he went into convulsions and died soon after.

A nurse told me of another case where a boy wanted to see for himself how whisky made one feel. He had seen his father drink it and was curious to make an experiment. It made him unconscious and he died from the effects of it.

Fortunately, such accidents are not very common. Far more often alcohol causes harm to children through the fact that some grown person is under its influence. Intoxicated persons often bring danger to others, especially to children, because they do not know what they are doing. I have seen a whole boat load of people, some

of them children, in danger because of the recklessness of a drunken man. A nurse told me of a case in the hospital. A chauffeur had been seriously injured because he had taken some whisky, and it made him see



A MAN WHO DRINKS IS NOT ALLOWED TO BE AN ENGINEER

double. He had crashed into a telegraph pole before he knew what he was doing.

Accidents like the following are in the papers almost every day: "A chauffeur has been imprisoned for six months for reckless driving of an automobile, and fined a hundred dollars for being intoxicated. He did not know what happened until his automobile crashed into a tree."

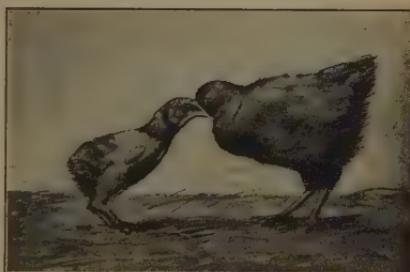
A friend of mine heard two men who were sitting near her on a train conversing. One said to the other,

"I had a beautiful ride into town in Mr. A.'s auto this morning. He invited me to go back with him this afternoon, but I preferred to take the train. He drank so much during the day that I was afraid to go back with him, and I keep wondering if he has not run over some one."

Think of the harm that may come to little children on the street where grown-up persons in this condition are in charge of vehicles. Railroad and trolley companies are very particular, before they give employment to any man, to make sure that he does not use alcoholic liquors.

You read in *Good Health* about the effect of alcohol on the dogs Bum and Tipsy. You remember how it poisoned them to such an extent that they were not like their brother and sister, Nig and Topsy. They died before Nig and Topsy, and of all their puppies, only four grew up; while Nig and Topsy when they died left forty-one grown-up puppies.

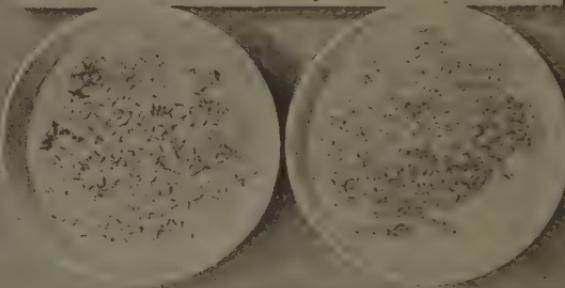
Here is a picture of two chickens from the same brood. The little one was given small doses of alcohol every day. Its growth was stunted, as you see. It is not half so large as the one that had no alcohol.



CHICKENS FROM THE SAME BROOD

The smaller was given small doses of alcohol

Tap Water Alcohol 2%
6 Days



FROGS' EGGS AFTER SIX DAYS

Notice how many more tadpoles hatched in the water in which
there was no alcohol

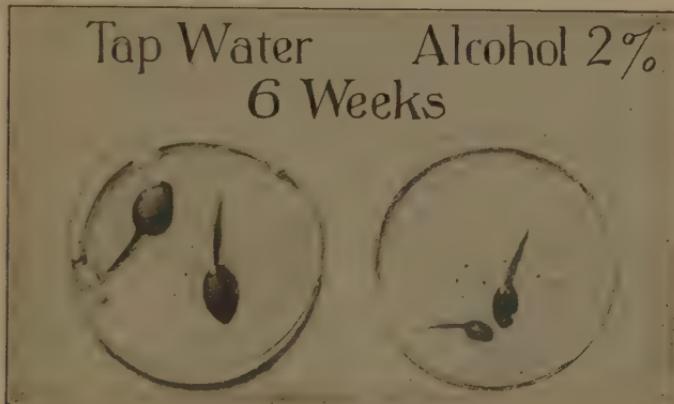
Tap Water Alcohol 2%
14th Day



TADPOLES FOURTEEN DAYS OLD

See how much larger the tadpoles are that lived in water free
from alcohol

An interesting alcohol experiment was made with frogs' eggs. You probably have all seen frogs' eggs, and have watched the tadpole grow from day to day. An English scientist took a certain number of these eggs and put one half of them into a bowl of water from the faucet; the other half he put into a bowl of water to



TADPOLES SIX WEEKS OLD

It is the same story; the tadpoles that did not have alcohol grew larger than those that had it

which a little alcohol had been added (ten drops of alcohol to one ounce of water). He kept these two bowls with their eggs side by side and watched the tadpoles develop from day to day, taking pictures of them from time to time.

In the first picture, taken on the sixth day, you can see with your naked eye how much larger the pure-water tadpoles are than those in the water and alcohol.

If you look at the picture with a magnifying glass, the difference will be much clearer. The scientist found that many of the eggs in the alcohol and water failed to develop. Among those that did develop many were "undersized and feeble." The next picture was taken on the fourteenth day. You can see the difference still more clearly this time. Each picture tells the same story, — alcohol hinders the growth of a tadpole.¹

In these three cases of the dogs, the chickens, and the tadpoles we have seen proofs of the way in which alcohol stunts the growth of young animals.

Alcohol cannot hinder the growth of an animal or person already grown, but it may do harm which we cannot see and which may be even more serious.

¹ These experiments with the chickens and tadpoles were described by William McAdam Eccles, M. S., F. R. C. S., of England, in a paper presented to a society of which Dr. William Osler of Oxford is the president.

CHAPTER XX

DOG BITES

During the month of June, 1908, I received three hundred and thirty-two clippings from the newspapers, telling about people who were bitten during that month by dogs. Of these, two hundred and nineteen were boys, one hundred were girls, and thirteen were grown people. Why were there over twice as many boys bitten as girls? And why so few grown people? Perhaps the two notices I am going to quote will suggest an answer.

"George Hanes was the victim of an enraged dog yesterday, and as a result is suffering from a number of bad bites. The boy was walking along the street and in passing a butcher's wagon kicked at a dog belonging to the butcher. The dog was eating a bone and resented the blow. He attacked the boy, and before he could be dragged away, the dog had torn his hands and face badly. The wounds were cauterized."

"Walter Warren was sitting on a stoop playing with a big mongrel dog, when something the boy did angered the animal and it attacked him. The dog managed to reach his face and buried its fangs in his right cheek. The other children fled screaming with terror. The cry

of 'mad dog' was soon raised and there was much excitement. Several men came to the boy's rescue. He was taken to a hospital and there his wounds were cauterized and dressed."

Most of the boys bitten were between seven and eleven years old. Have you not noticed that boys of about that age like to see what a dog will do? Boys love dogs, and they do not realize the danger there is in meddling with a strange dog. Most girls are more cautious than their brothers. Older people know better and have learned to leave dogs alone.

The fact is that boys bother dogs more than girls and grown-up people do. Biting is a dog's only means of self-defense. He must bite to protect himself.

The newspapers call most of these dogs that bite children "mad," but this is not true. Dogs are children's playmates. They play ball, run, jump, and are happy or disappointed, as the case may be. They resent harsh treatment just as human beings do. It is just as much the dog's nature to bite if it is tormented as it is a boy's nature to fight if he is ill-used.

"Mad" dogs are very uncommon. Many good people believe that there are none and that there is no such disease as rabies, or hydrophobia. Yet scientific men tell us that there is, and every one dreads it so much that whenever a dog begins to act queerly, people say immediately that it is mad.

The agents of the Society for the Prevention of Cruelty to Animals say that rabies is so rare that they have no fear of it. They probably handle more dogs than any other group of people in the world. Agents have been



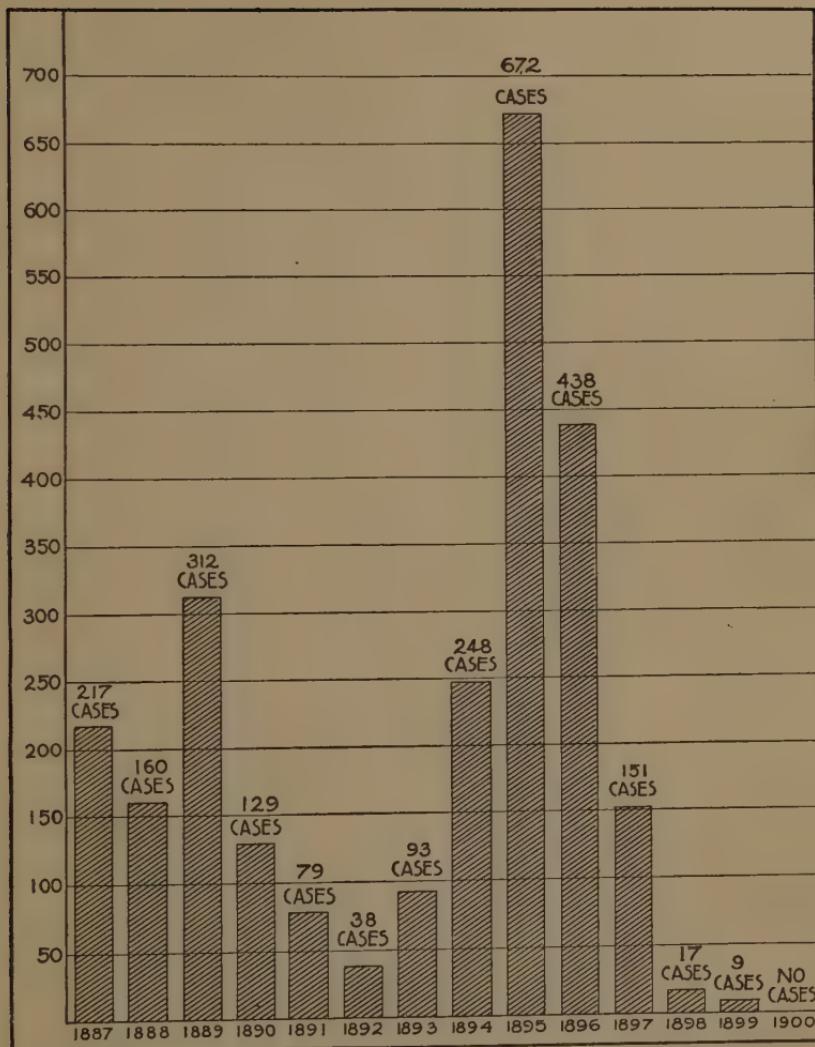
A DOG AMBULANCE

bitten more than fifteen thousand times by dogs, yet never has a case of hydrophobia developed from these bites. This may be due in large degree to the fact that they know at sight a rabid dog from other dogs. It is their business to take care of dogs. Notice the picture of a dog ambulance.

A mad dog never yelps or barks. If he makes any sound it is a howl, said to be "impossible to describe, but never forgotten when once heard." A mad dog never froths at the mouth. A brown, ropy mucus hangs from his mouth, which he often tries to paw off with his fore-legs. A mad dog never runs about much. He is usually alone and jogs along slowly from place to place, paying no attention to things unless they come in his way. He is supposed to dread water, but he does not. He will plunge his head into it and will cross streams if they lie across his path. In the last stages of the disease he can't swallow water, and it is difficult for him even to lap it.

The disposition of a dog often changes if he is mad. A frisky dog is apt to become quiet, and the quiet dog is apt to become frisky. There are no more cases of rabies in the summer time than in winter. There is no "mad-dog" season to fear.

We can stop having rabies or mad dogs in our country in a short time if we are willing to do as they have done in a number of European countries. They have had no rabies in England for nine years. The authorities there issued an order that all dogs should be muzzled when let out of doors. Any dogs found unmuzzled, unless held by a leash, were captured and the owners were fined; or if the owners could not be found, the dogs were killed. In a short time they had no rabies. (Study the following diagram.)



NOTE HOW RABIES DECREASED WHEN THE DOGS WERE MUZZLED AND
INCREASED WHEN THEY WERE NOT

You can see that in 1889 England had 312 cases of rabies. In this year an order to muzzle the dogs was made. The disease steadily decreased, until in 1892 (three years later) there were only 38 cases. The authorities thought that they had the disease under control and allowed the dogs their freedom again. But rabies was not entirely removed, and from the 38 cases left, the disease rapidly increased, until in 1895—in only three years' time—there were 672 cases. Again the authorities became alarmed and again issued the order to have all the dogs muzzled, with the result that in 1900 there were no more cases. Rabies was stamped out of England.

We need to do something. In 1908 the United States Department of Agriculture made a study of this subject; it was discovered that the disease is increasing here in America. Of all infectious diseases this is the easiest to stop.

We do not like to see dogs muzzled. It seems unkind. No one person sees mad dogs often enough to make it seem important to protect ourselves so strictly against them. I have never seen one, and I doubt if many who read this book have. But if we think about it with the future in mind, muzzling our dogs will no longer seem an act of unkindness. In three years' time the disease could be stopped, and all dog suffering and human suffering from this cause would cease. Also an end would be put to the fear of dogs, which is often so great as to

cause death. The dog only needs to be muzzled when in public places or running at large. The muzzle is a kindness in the long run.

In Australia they have never had a case of rabies, and they do not intend to have it. They have a law absolutely forbidding the taking of dogs into the country.

If any one is bitten by a dog, the wound should be thoroughly cleaned with warm water, and the blood squeezed and allowed to flow. Then it should be treated as any other wound, with an antiseptic dressing.

If the dog was known to be mad, the person should be taken to one of the Pasteur Institutes and receive treatment. There are institutes in New York, Chicago, Baltimore, Richmond, Atlanta, Ann Arbor, St. Paul, New Orleans, St. Louis, and Houston.

CHAPTER XXI

MISCELLANEOUS ACCIDENTS

CHOKING

In the throat there are two openings, one into the lungs and the other into the stomach. The opening into the lungs is called the larynx; it is on the upper end of the windpipe. The opening into the stomach is called the pharynx; it is on the upper end of the esophagus. It is more serious to get an obstruction in the larynx than in the pharynx. When the larynx is stopped up breathing stops, for the air cannot get into the lungs. We can live far longer without food in our stomachs than we can without air in our lungs. So the seriousness of choking depends on whether the trouble is in the larynx or the pharynx.

The act of coughing forces a blast of air from the lungs. If something has gotten into the windpipe that should not be there, a person coughs. Coughing is nature's way of getting rid of whatever is lodged in the windpipe. But sometimes one coughs even when the obstruction is in the opening to the stomach, not in the larynx. This is because the whole throat is irritated. The pressure against the windpipe, even if the object

itself is in the pharynx, may cause coughing. But when there is no coughing we can be certain that the troublesome thing is in the opening to the stomach.

There is nothing better to do than to slap the person on the back between the shoulders. While this treatment is in progress, he should be holding his body bent forward over a chair. If it is a very young child who is choking, hold it with its stomach on your knee, and its head bent downward, while you slap its back gently. If this is not successful, putting one's finger down the throat may cause the sudden effort to vomit, and this may force out the obstruction.

If a coin or a marble or a nail or a button is swallowed, it may cause more trouble to try to get it out than to let it go on through the body. These things seldom do harm. In this case it is well to eat a lot of bread or potatoes, which will help to carry the object along and keep it from doing any injury on its way through the body.

Children should be taught never to hold small objects in their mouths while at play. It is not safe. I have found in my clippings quite a number of accidents to children which came about in this way. One happened to a boy who had a screw in his mouth while he was running to meet his father. The screw slipped down his throat and stopped up the windpipe. The father ran to the hospital with him, but before the doctors could get the screw out, he had died.

Another clipping was about a little girl named Ruth Tabor. She laughed when she had a pin in her mouth. It went into her windpipe, but was not large enough to stop her breathing. Her parents took her to the hospital and had it taken out.

One child was choked to death by a large bean that got into her windpipe. A grain of corn caused the death of another. A curious accident happened to a boy named Frank Goldman. He swallowed a small, round whistle. It stopped in the windpipe and every time he breathed, the whistle blew. He was taken to the hospital, and the doctors finally gave him ether and got it out.

CRAMPS

Cramps seize one most frequently when in the water. Many deaths from drowning are due to cramps. Even good swimmers are sometimes unable to escape them. If you have ever had cramps, never swim far from shore or out of reach of prompt help of some kind. It is not safe. No matter how good a swimmer you are, remember that being in the water a long time increases the liability of having cramps.

People in general are learning to be more careful about running risks of this kind. It is being recognized as foolhardy to go long distances from shore without having some one near by with a boat. It is more and

more the custom for boys and girls and even grown-up people when taking long-distance swimming tests to have a boat alongside for each swimmer.

A cramp in the leg is about as painful as anything of which I know. The muscle becomes contracted and makes a bunch or a knot. It makes one helpless and faint. Brisk rubbing will take the cramp out better than anything else. When cramps come in the leg a good remedy is to stretch the heel out and away as far as possible. A friend who is subject to cramps has found this method to be always successful. I have had muscles sore for days after having a cramp.

FAINTING

In many schools there are girls who are known to faint readily. Fainting can easily become a habit. In one of the New York schools there was a girl who fainted on the least provocation. The teacher talked about the case with the principal of the school, who requested to be called the next time the girl fainted. It was not long before she was summoned to the class room, and, after doing everything possible to restore the girl, informed her that if it happened again, she would have to be expelled, that her fainting caused too much disturbance among the children. The result was that the girl never fainted again and there has not been a case of fainting in that school of nine hundred girls for over

two years. This is because the principal of this school has taught the girls that fainting can usually be controlled. This is not always the case. A very sudden fright or injury will sometimes take a person unawares and cause fainting.

When this happens the first thing to do is to place the person on the floor or on a couch. There is not sufficient circulation of blood in the head, and it is necessary to send the flow in that direction once more. The reclining position is the first help. A further help is to raise the feet somewhat by putting something under them, or to lower the head by letting it hang over the edge of the couch. Then loosen any tight clothing and wipe the face with a cloth wet in cold water. A whiff of smelling salts, eau de Cologne, ammonia, or even vinegar, if one has nothing better, will often give stimulus enough to bring back consciousness. These should never be given directly from the bottle. A little on a handkerchief is sufficient.

A faint ordinarily does not last long, and the person will revive before any of the steps we have mentioned are taken. But sometimes consciousness does not return in spite of all these remedies. This probably means something more serious than a faint, and the doctor should be called.

If you ever suspect that you are going to faint, a good plan is to drop the head down as low as possible between

the knees. This assists the blood to flow into the head. If one is in church or any public gathering, dropping the head in this way will often "bring one to" sufficiently so that one may walk quietly out without causing a commotion.

Fresh air is often all that is needed to bring one to, and for this reason people should not crowd around a person who has fainted. Bad air will sometimes cause one to faint.

FITS

A person having a fit is treated the same as one who has fainted, with the addition of protecting the person against injury. Put a rubber eraser or a cork or a piece of wood between the teeth, first securing the object with a string in case it should drop into the patient's throat. This is to keep the tongue from being bitten. A handkerchief or towel will serve the same purpose. Fits in children are usually due to some trouble in the stomach or bowels. Worms cause them sometimes. An emetic and a cathartic are good remedies.

HICCOUGHS

The next time you have the hiccoughs try this treatment. Stop up both ears with a finger of each hand and drink slowly some water from a cup held by some one else. If this is not effective, try making yourself sneeze

by scattering a few grains of pepper in the air. A woman in France once had the hiccoughs for four days. She was asked to show her tongue, and it was noticed that the hiccoughing immediately stopped.

Pushing the tongue out firmly and holding it for a minute or two has often proved successful. Taking a spoonful of dry sugar into the mouth or chewing a crust or a cracker will often stop them. A friend has always been able to stop them by saying slowly and emphatically the word *fagot* several times.

Plato, one of the Greek philosophers, tells in his writings how a physician told Aristophanes, who had the hiccoughs from eating too much, either to hold his breath or to gargle his throat with a little water, and then he said if these were unsuccessful to " tickle your nose with something and sneeze ; and if you sneeze once or twice even the most violent hiccough is sure to go." Aristophanes must have had a severe attack, for he had to resort to sneezing to stop it.

CHAPTER XXII

ACCIDENTS FROM HEAT AND COLD

SUNSTROKE AND HEAT PROSTRATION

A friend of mine used always to surprise me by taking an umbrella with him even when there was not a cloud in the sky, but I soon understood why he did this. When he was a boy he had a sunstroke, and ever since that time he has had to be careful. His head is very sensitive to the rays of the sun, and even in winter time he has to protect it from the direct rays. In summer when he is out of the city and does not want to carry an umbrella, he wears a large pith hat, such as the English soldiers wear in India to protect themselves from the tropical sun.

Strange as this may seem, sunstroke is more common in our climate than in the tropics. This is because the people living in the constant heat of the tropics have learned to protect themselves better than we. With us, when a very hot day comes in midsummer, people who are not accustomed to protect themselves run risks that people living in a tropical climate would not think of running. And so in the papers we read of a great number of persons who have had sunstrokes or heat prostrations.

There are several ways of protecting oneself. White cloth or white material of any kind reflects the sun's rays better than black cloth or dark-colored material. Test this sometime by putting pieces of black and white cloth over some snow in the sunshine. You will soon see which color throws back the sun's heat and which absorbs it. There is a good reason for our preferring light-colored clothes in the summer time. They not only look cooler, they *are* cooler.

It seems strange that woolen shirts are better than cotton for any one working in the heat. But it is a fact. Air passes through wool much more readily than through cotton. Air coming in contact with the moist skin tends to cool the body by the process of evaporation. You know how a jug of water can be cooled in the summer time by hanging it, wrapped in a wet towel, where the wind will blow on it. So long as the towel is kept wet, the cooling process, due to evaporation, continues. Sweat keeps the body moist; air passing over the skin causes the sweat to evaporate, and this cools the body. The principle, as you see, is the same as in the case of the cooling jug. In summer we need to drink more water than in winter, because we sweat or perspire more.

Remember that when a person has once had a sun-stroke, it will always be necessary to be careful afterwards. One is much more susceptible to it a second time. It is better to be a little careful and so avoid the first time.

~~SEND AT ONCE FOR AN AMBULANCE AND THE NEAREST PHYSICIAN.~~

DEPARTMENT OF HEALTH,
THE CITY OF NEW YORK.

Sunstroke and Heat Prostration.

CAUSE.

Sunstroke is caused primarily by excessive heat. The constant drinking of alcohol, or even a single excess, is one of the greatest of the contributing causes. Other contributing or predisposing causes are over-exertion or exhaustion, excitement, loss of sleep, worry, lack of ventilation of sleeping or living rooms, over-eating or the eating of indigestible foods. It is more apt to occur among those whose work exposes them to the direct rays of the sun, and especially between the hours of 11 A. M. and 4 P. M.

PREVENTION.

Avoid, if possible, prolonged exposure to the sun's rays. On hot days wear thin clothing. If obliged to work in the sun, wear a light colored, well-ventilated hat, with at least an inch of space between the top of the head and top of hat. Wet the hair at frequent intervals with cold water. Have as much air as possible in sleeping rooms. Take baths often, at least once daily. Drink considerable quantities of cool water (*not ice water*), for the purpose of inducing perspiration. Free perspiration prevents the body from becoming overheated.

If a feeling of dizziness, headache, nausea, or exhaustion occurs, lie down in a shady place, and apply cold water to head, face and neck.

TREATMENT.

IF SUNSTROKE, THE SKIN WILL BE HOT AND DRY. Remove the patient to the nearest shade. Place in a sitting position against a tree, wall, or anything that will support the back; loosen collar, necktie, and all tight clothing. Pour cold water over the head and face, and if very hot, rub body with pieces of ice. If the patient is able to swallow, give cool drinks of water. *Do not give alcoholic stimulants.*

IF PROSTRATED BY EXHAUSTION AND EXCESSIVE HEAT, THE PERSON WILL BE PALE AND FAINT. Remove to the nearest shade, place on the back with head on a level with the body. Loosen all tight clothing. Rub the hands and feet until circulation is restored. Bathe face and body with warm water, and apply warm cloths to the latter. Give hot drinks, tea, coffee, milk or water.

By Order of the Board,

THOMAS DARLINGTON, M. D.,

EUGENE W. SCHEFFER,

President.

Secretary.

Sunstroke is due to the direct rays of the sun, but heat prostration may be due to other causes. It may come on at night in close rooms. Men working in engine rooms are sometimes overcome.

There is a decided difference in the treatment of the two. In sunstroke the temperature is above the normal, and the skin is hot to the touch; whereas in heat prostration it is apt to be cool, or even below the normal.

The Department of Health of New York City issues every year a bulletin about sunstroke and heat prostration, which is distributed freely. This bulletin gives the cause, the prevention, and the treatment of both sunstroke and heat prostration. It deserves careful reading (see bulletin on preceding page).

FROST BITES

A girl I knew fell into a lake when she was skating. It was a bitter-cold, windy day, and when she was brought home her clothes were frozen on her. Her mother was an intelligent woman, but she was so excited that she lost her head. She took off the frozen garments and put her daughter into a tub of warm water. The result was that the girl suffered intense pain for hours. This mother quickly recognized the mistake, but it was too late to set matters right then. What she should have done was to have gently rubbed her daughter with a woolen cloth wet in ice water, or with a handful of snow, until she was

warm again. You know how your fingers ache when you come in from the cold and warm them too quickly. It worked the same way with this girl, except that instead of only her finger tips aching, her whole body ached. One should be careful in rubbing to do it gently. The skin is easily rubbed off when it is frozen. If the skin becomes broken from rubbing, the wound should be treated as a "third-degree" burn with carron oil.

CHILBLAINS

Many people suffer with chilblains during the winter time.

Chilblains are due to poor circulation of blood in the feet, and poor circulation is very often due to tight shoes. Wearing one pair of tight shoes during a winter may start a trouble with the feet which will last for years. After you have once had chilblains, you are likely to be troubled with them year after year.

Going about with wet feet, as boys and girls are so apt to do when skating and sliding time comes, is very bad for the feet. The stockings should be changed whenever the feet get damp. This precaution would greatly lessen the aches from chilblains. To get rid of chilblains it is first of all necessary to improve the circulation of blood in the feet. Other helps are to rub the feet with ointment, to wear loose, comfortable shoes, and to change the stockings daily.

CHAPTER XXIII

DROWNING

This is a picture of Stanley McLaughlin, a boy who saved three lives within one year. Three things enabled him to do this: first, he could swim; second, he could dive; third, he had courage and presence of mind.



STANLEY MC LAUGHLIN, WHO SAVED
THE LIVES OF THREE BOYS

It is worth while to learn to swim. Besides being useful it is, as you know, one of the most delightful of outdoor sports. There are schools in this country and in Europe where a boy or a girl cannot get a diploma of graduation until swimming has been mastered.

It is hardly worth while for a child to try to learn to swim before the age of eight or nine years, for up to that period the head is too large in proportion to the rest

of the body. He could learn when younger, but it would take a long time and he would need a teacher. When a child is eight or nine years of age he learns very quickly and does not need assistance. He simply watches other people, and the desire to learn is so strong at that age that almost before he knows it he can swim. Some things which we learn we are apt to forget, but when we have once learned to swim, the knowledge is ours for life. It is never forgotten. If a person can swim, he is not so likely to lose his head in case of accident in the water.

The girl in this picture who is climbing up to her house in the tree was twelve years old, when one day her little brother fell off her father's yacht. She was a good swimmer, and when she heard the splash she did not hesitate an instant, but dived in beside him and brought him up so quickly that the little chap said afterwards, "I didn't even get my hair wet." It was over before either of them had time to get frightened. Every summer this girl and her sisters



THE GIRL WHO SAVED HER LITTLE
BROTHER'S LIFE

practice rescuing each other and their companions just for sport. They swim, towing each other round in the water. They go out in a rowboat and tip it over on purpose; then they put it right side up again, bail it out, and row back to shore. This is great fun. Besides, it teaches them what can be done in an emergency on the water.

Another thing these children do is to put on some old clothes, including shoes and stockings, over their bathing suits. Then, at a given signal, they dive into the water and see which one can take her clothes off the quickest in the water and swim back to the dock. This is one of the greatest sports of the summer time for these girls and their friends.

One cold winter's day one of these sisters was skating with a friend. It was almost dark and they came unknowingly to a stretch of thin ice and fell in. This girl did not lose her self-control. She swam, keeping her friend, who could not swim, above the water, while the friend called, "Help, help!" Some ice cutters heard her cries and rescued them. The girl who could swim was declared a heroine, and her name was in all the papers. The other girl did her part, too, by shouting.

If you fall overboard, do not do as this girl in the picture is doing. She is splashing with her arms and holding her head altogether too far out of the water. All you need is to have your mouth and nose out of water. Keep the arms underneath the surface. A finger on an oar will

keep a person afloat (see picture on next page). Many people float without any kind of support. Lie quietly on your back and breathe deeply. If you have nothing to hold on to, try to swim even if you have never learned how. Some people do not have to learn. I knew a young lady who was once carried out beyond her depth at the seashore. She did n't know that she could swim,



IF YOU FALL OVERBOARD, DO NOT DO THIS

but she did swim back to shore, and from that time on she has been a good swimmer.

A man who could only swim a little, once accidentally fell overboard. He had on a Derby hat. He noticed that it floated. It occurred to him that it might act as a float. So he held it right side up and the air underneath was enough to keep his head above the water. He paddled with the other hand and used his feet, and so managed to get to shore.

The body is a little lighter than the water it displaces, provided the lungs are full of air. The reason a drowning person sinks is because most of the air is out of his lungs. When he comes to the surface he uses up what



ALL YOU NEED IS TO HAVE YOUR MOUTH AND NOSE OUT OF WATER

air is in his lungs in calling for help and sinks before he can breathe it in again.

In going out in boats it is well to have an oar or a boat hook where you can get hold of it easily, not tucked out of sight under seats or in a cabin. Ropes should be kept coiled ready for instant use. I know a mother and daughter who were thrown off their motor boat when it struck on a rock going through Little Hell Gate. They both could swim, but they had on all their city clothes.

The daughter was quickly rescued, but the mother was out of reach. In the excitement no one thought of handing her the boat hook, which was in easy reach of all of them. A rope was finally thrown to her.

One should keep in mind what means of help are possible in such a case, and then be sure that everything is kept in readiness.

A lecturer on the first aid to the injured recently told me that he thought there were more drowning accidents in winter than in summer. It seems incredible, but if you read the papers during the first days of winter, when the ice is just beginning to form, you will see many notices of drowning. Boys and girls can't wait until the ice is thick enough before they try their skates.

Last winter a fourteen-year-old boy fell into a hole which the ice harvesters had left the day before. Another boy, ten years old, heard his cry for help and ran to the ice house, where he knew there was a ladder. He hurried back with it and found that it was just long enough to reach across the hole. Then he crawled over the rungs and pulled his friend out. Ladders are not always so conveniently near as this, but fence rails, branches from trees, or boards are often near by.

Boys and girls might organize a winter Volunteer Life Saving Corps and see that their skating ponds are provided with such means of help as boards or a ladder or a rope.

CHAPTER XXIV

ARTIFICIAL RESPIRATION

A few years ago the English Government appointed a commission, with Professor Schaefer of Edinburgh at the head, to find the best way of resuscitating a drowning person. He found by experimenting with animals that drowning was not caused by water getting into the lungs, but by the failure of the heart to do its work. The heart becomes paralyzed.

This being the case, it follows that all the familiar directions, such as standing people on their heads, or rolling them on barrels, or shaking them to get the water out of their lungs, are useless. Such treatment does more harm than good. The one important thing to do, and to do quickly, is to get the person to breathe again. Not a second of time must be lost.

Professor Schaefer made many experiments in causing people to breathe by artificial means. There is an instrument called a spirometer, which measures the amount of air a person can take into his lungs. Spirometers are in almost all gymnasiums. A boy who goes into the "gym" first has his lung capacity measured by one of these instruments and then takes exercises to help

increase it. By a spirometer test he can tell at any time just how much he has gained.

Professor Schaefer found through his experiments that by a certain method of manipulation he could make a person breathe more air into his lungs than could possibly have been breathed by that person if unaided. The method is easy, and you can certainly learn to use it.

The pictures show the positions to take. Lay the person on his stomach on a level place. Turn the head to the left side, so that the mouth and nose are away from the ground. Either kneel by the side of the patient, or sit on his hips, and place both hands over the small of the back, with the thumbs nearly touching and the fingers spread out over the lowest ribs; then swing yourself forward, counting three slowly on this forward movement. Now quickly swing yourself backward, releasing the pressure, but keeping the hands on the body in the original position and the arms straight. In three more counts repeat this movement. This should be done ten or twelve times a minute without pausing between the movements.

While one person is giving the artificial breathing, others can be getting dry blankets or hot-water bottles, or they can be rubbing the arms or legs of the patient. There should be no attempt made to force the patient to drink anything until after breathing is restored.

Professor Schaefer tried all the old methods of artificial breathing, and tested them with a spirometer, but by none of them could he get so much air into the lungs as by this last method. In fact, by the old methods he could not get enough air into the lungs to make a person comfortable.



SWING THE BODY SLOWLY FORWARD

When a person is laid on his back, as he was in some of the old methods, the tongue had to be fastened in some way so as not to fall back into the throat and cause choking. By Professor Schaefer's method the tongue takes care of itself. The water and mucus in the throat and nose run out themselves.

Professor Schaefer's method was found so effective and easy to learn that the English societies corresponding

to our Volunteer Life Saving Corps have adopted it. The English Government Life Saving Service has also adopted it. I understand that our Volunteer Life Saving Corps are considering it, and that our government is in correspondence with some of the European countries with a view of finding out more about it.



THEN QUICKLY SWING THE BODY BACKWARD

It is well worth while to practice artificial respiration. It is not only useful in cases of accident from drowning, but whenever an accident of any kind has caused a person to stop breathing. It might be the means of saving a boy's life on the football field when his breath has been knocked out, and it is useful to revive a person who has received an electric shock and breathing suddenly stops. It can be used also to resuscitate people suffering from poisoning by illuminating gas.

Do not wait for a doctor.

Do not wait to remove the person's clothes.

Do not wait for anything.

The one thing absolutely necessary is to make him breathe. Not a second's time should be lost. In artificial breathing lies the one hope of saving the person's life.

TO THE TEACHER. It is very important that children should practice this method of resuscitation. When the time comes that some one of them has to use it, there should be no hesitancy. A second's delay may be fatal. The dividing line between life and death is less than a second.

The difficulty in practicing the method may not be easily overcome. I would suggest that it be practiced when the children are on some excursion. Some teachers may be able to practice it in the class room or in the school yard, while others may find this very difficult. It is to be kept in mind that a life may be saved by teaching this method of resuscitation to the children so that its use becomes automatic. To know about it is not sufficient. It is only by getting the children to *do* it that it can be fixed in their minds so that they can use it.

CHAPTER XXV

PLANTS POISONOUS TO THE TOUCH

Poison Ivy

Twenty years ago I remember seeing my brother with a red, distorted face, eyelids so swollen that he could hardly see, and hands so puffed out that they looked like boxing gloves. He was miserably uncomfortable. He could not read, for he was not allowed to use his eyes; he did not want to go out of the house because he looked so frightful. All this misery came from the fact that one night he had camped out and had slept in a bed of poison ivy.

Last fall a woman was out walking on one of the upper streets in New York City, when she met a nurse wheeling a baby carriage; in the baby's hands was a beautiful cluster of poison-ivy leaves. She stopped the nurse and asked her if she knew what the baby had. Of course when the nurse was told that it was poison ivy she was greatly troubled. She had seen the pretty scarlet leaves and only wanted to please the baby with them.

Poison ivy grows in all sorts of places; in deserted city lots, along country roads, even on stone walls and on the sands near the sea. It is found north and south, east and

west, and in both hemispheres. It is easily recognized. Its leaves are always grouped in threes. When they first come in the spring they are red and waxlike in appearance; in summer they are glossy green, and in the fall they turn scarlet. They are often so pretty it is no wonder that the nurse gave some to the baby and that children often gather them in bouquets.

The poison is found in all parts of the plant,—in the stems, leaves, roots, fruit, and even in the pollen. The reason why some people who never touch it are poisoned by it may be that the pollen carried by the wind affects them, or dust that has lain on the leaves may be the carrier. The plant is poisonous in all seasons of the year, although one is more likely to be poisoned in warm weather, when the skin is moist. Some people are never poisoned. One usually feels the effects of it some time between four hours and four days after exposure. It causes intense itching, and the skin becomes red, swollen, and blistered.

In 1897 Dr. Franz Pfaff, of Harvard, conducted some experiments and found that the poisonous element in poison ivy is a heavy, gummy oil. The way to remove a grease or oil from one's skin is to use soap and warm water, and this is a treatment for ivy poisoning. Many remedies are suggested, but nothing is better than this thorough scrubbing with soap and water. If it is not thorough, the washing will only spread the oil over a larger surface.

As this poison is soluble in alcohol, bathing the parts with alcohol is a good remedy, but it must be renewed frequently or it will tend to spread the poison in the same way that an ordinary washing with soap and water does. Many people prefer to use sugar of lead (lead acetate) dissolved in alcohol and water, half and half. It is a sure remedy, but is itself a poison and so must not be taken internally or be left where young children can reach it.

A friend of mine told me that he was very susceptible to ivy poisoning and every year suffered from it. He heard about the soap-and-water treatment and decided to try it. Last summer, every time he came in from a tramp in woods or country, he was careful to wash himself thoroughly. Until the last day of his vacation he had not been poisoned. From the last tramp of the season he came home late in the evening, and was so tired that he let the scrubbing go until the next morning. The result was that the poisonous oil had time to affect him, and he was troubled for some time. He should have kept right on with the



SOAP-AND-WATER TREATMENT FOR
IVY POISONING

soap-and-water treatment. It often helps, even after the inflammation has begun.

It may be that some of the people who are proof against this poison are just those who have the habit of washing themselves carefully when they come in from the woods or country.

Bathing the poisoned parts in hot water alone is soothing and helps to dissolve the oil. A physician told me he had known this to work most successfully.

The beautiful woodbine is often mistaken for poison ivy. There is no need of this confusion, for the woodbine, as you know, has five leaves and dark blue berries, while the poison ivy

has only three leaves, as the picture shows, and yellowish-green berries. A simple way to fix this difference in one's mind is to commit to memory the following six-line jingle:

Berries red—
Have no dread;
Berries white—

Poisonous sight;
Leaves three—
Quickly flee.



POISON IVY

Remember that this applies only to plants poisonous to the touch. Some plants such as the pokeberry and deadly nightshade have red berries which are poisonous if eaten but are not poisonous to the touch.

SWAMP SUMAC

A man was once badly poisoned by going into a thicket of swamp sumac in the winter time. Four months later he put on a cap he had worn on the day that he was poisoned and new poison blisters soon came out on his forehead.

Swamp sumac is the most poisonous shrub in the United States. It is a cousin of the poison ivy. They are in the same botanical family. Dr. Pfaff discovered that the poison in this plant is the same as that in poison ivy. Hence the treatment is the same, — a good, thorough washing with soap and water.

The clinging and lasting character of the oil is shown by the way it remained on the cap.



SWAMP SUMAC

Swamp sumac is sometimes called poison dogwood. I have been told in the spring to leave our beautiful flowering dogwood alone as it was poisonous. It is a pity for people to confuse the names of these two plants, for they have nothing in common. Swamp sumac should never be called poison dogwood. Swamp sumac, as its name indicates, lives in swampy places. It is easily distinguished from the sumac found on hillsides and in pastures. One prefers dry, rocky soil, and the other moist places; one has beautiful clusters of dark-crimson fruit, while the other has long, loose racemes of white berries; one has from eleven to thirty-one leaflets, the other from seven to thirteen. You have only to remember

Berries red —
Have no dread.

CHAPTER XXVI

SNAKE BITES AND INSECT STINGS

There are four kinds of poisonous snakes in the United States,—the rattlesnake, the copperhead, the water moccasin, and the coral snake. These four kinds of snakes are thick-bodied and have blunt, club-shaped tails and broad triangular-shaped heads. Their eyes are vertical slits, while those of other snakes are round.

The coral snake is found only in the southern states and is not frequently seen even there. Its name suggests its brilliant markings. The water moccasin also is found only in the southern and middle states. The rattlesnake is scattered all over the United States, but is being slowly exterminated. There are now scarcely any poisonous snakes in New England or in any other settled parts of our country.

All other snakes in the United States are harmless. They are not only harmless but useful. They eat insects, field mice, and other pests. It is not likely that one



THE RATTLESNAKE, FOUND ONLY
IN SPARSELY SETTLED REGIONS

person out of thousands has ever so much as seen a dangerous snake, except in captivity or in alcohol.



CORAL SNAKE, FOUND ONLY IN THE SOUTHERN STATES



THE COPPERHEAD, FOUND IN THE MIDDLE AND SOUTHERN STATES



WATER MOCCASIN, FOUND IN THE SOUTHERN AND MIDDLE STATES

If a person has been bitten by one of these snakes, something ought to be done at once. The giving of whisky is a very doubtful remedy. A number of deaths have been caused by the alcohol. A three-year-old child was once given a pint of whisky for a rattlesnake bite, and of course it died. A child cannot stand that amount of whisky. Indeed very few older people can unless they are used to it.

I once saw a rattlesnake coil up and spring at a man. The man dodged and the rattler fell to the ground. It made me wonder what I should do if a rattler should bite me or my brother. I have learned

that there is nothing better to do than to suck the poison out. The fangs of the snake make a very small opening, and on this account it is well to cut into the wounded place and squeeze and suck the blood. In this way you

will be more likely to get all the poison out. Do not delay; every moment is precious.

About one out of every ten persons bitten by a poisonous snake dies. A strong, healthy person is not likely to die from snake bites. If the person bitten becomes discouraged, a cup of strong coffee or a teaspoonful of aromatic spirits of ammonia diluted in water is good. It is best to move about so as to keep the nerve centers active; and like other wounds the snake bite must be kept clean.

STINGS

Honeybees, wasps, yellow jackets, hornets, and bumblebees all sting, as you know, if they or their nests are disturbed.

The pain that comes when they sting a person is due to a poisonous acid which is on the stinger. The stingers of these different insects are of various shapes: that of the honeybee is barbed; those of the wasp and hornet are pointed. All these insects have their poisoned weapons to protect themselves. The bee ought to be very careful of his, for he can sting only once. The stinger, being barbed, cannot be withdrawn after it has been used.

By looking carefully one can see the stinger and pull it out with a pair of tweezers. It can often be removed simply by sucking. If this is quickly done, less poison will be absorbed into the system.

The wasp and hornet can sting as often as they please, for their stingers are pointed.

Some people become almost frantic if a stinging insect of any kind flies near them. It is much better to be calm and to let it have a sip of honey from the flowers you carry or a taste of jam from your sandwich. It will soon be satisfied and fly away. Remember that if you do not disturb stinging insects they will not disturb you; but if you hit them or anger them, either intentionally or accidentally, they will promptly teach you to let them alone.

People have been stung to death by these insects. When hundreds of them get angry they are dangerous foes. Their poison, being an acid, calls for an alkaline treatment. Common cooking soda is good for this, but a simpler remedy, and one always convenient, is moistened earth. A little placed on the wound will soon relieve the pain.

CHAPTER XXVII

ACCIDENTS FROM ELECTRICITY

Lightning is one form of electricity. The fear of lightning causes more suffering in the world than the lightning itself. About one out of a hundred thousand persons in the United States is injured every year by lightning. Only one out of a million is killed. The likelihood that any one of us may be hurt is not great enough to make it worth while for us to be afraid of it. At any rate, fear of lightning does not do any good.

It is far better to cultivate a feeling of pleasure in watching a thunderstorm. I have seen girls — and grown people too — suffering the most intense fright during a heavy storm in the summer time. I have seen other girls crying out with delight over each flash of lightning and the crash of thunder that followed the flash. They loved to count the seconds that passed between the flash of lightning and the roar of the thunder, so as to calculate how far away the lightning struck.

These girls could have let themselves be frightened had they chosen to do so, but instead, they had made up their minds to enjoy the storm. Sound travels at the rate of about a mile in five seconds, so if you count the

number of seconds between the flash and the thunder, you can easily reckon the number of miles between you and the place where the lightning struck. To busy the mind with such problems is one practical way of keeping out a feeling of fear. It makes the storm interesting.

There are a few precautions to be observed. If you are in an open boat or an open field, make for shelter as quickly as possible. An exposed object in the open is more likely to attract the lightning than a protected object. Sitting in a draught by an open window is also considered dangerous.

Boys should not fly kites during a thunderstorm, for the kite string may act as a conductor.

For this same reason it is not safe to fly a kite near a heavily charged electric wire. If the string becomes entangled in any way with the wire, it is likely to act as a good ground connection and bring a strong electric current from the wire through the boy's body. One boy I read of got his kite string caught upon a cable, and in trying to untangle it received such a violent shock that he was made unconscious for some time.

There is infinitely less danger of our being hurt by lightning than of our meeting with some accident from the electricity that travels along wires over our city streets.

A girl was once walking along a New York street, when she came upon a crowd of people who were greatly

excited about something. A man had come in contact with a live wire and was utterly helpless. No one in the crowd knew how to help him. They stood there, looking on and doing nothing. This girl stepped forward, and taking off one of her rubbers, used it as a glove and pulled the wire away from him. It was all over in a moment. She replaced her rubber and disappeared. She did not give her name. No one knew who she was.

The man was not able to let go of the wire without assistance, for the electricity had contracted the muscles and made him helpless. The girl knew that rubber is a nonconductor of electricity, and that she was safe with the thickness of her rubber between her and the wire; but if she had left the rubber on her foot, she would have been just as well protected, provided no one touched her. With both rubbers on her feet, connection with the ground would have been cut off, and that was all that was necessary. An old pair of rubbers with holes in the bottom would not have been safe.

Suppose there had been no rubbers in the crowd, what could have been done? A man could have removed his suspenders, and putting them around the wire could have pulled it away. A woman could have taken her silk petticoat and, folding it several times, could have used it as a holder for grasping the wire and removing it. A person would have been safe if he had stood on a dry board and used as a holder several folds of dry newspaper or a dry

coat. Rubber, silk, and dry materials, such as wood, cotton, wool, or paper, are nonconductors of electricity.

I went to the head office of the Edison Electric Company and asked them how they taught their men to protect themselves against accidents from electricity. The chief electrician told me that the rule was never to touch strange wires. "Treat a strange wire as you would a strange dog. Leave it alone. The wire may be charged."

I asked him if there was enough voltage in the common electric-light current to cause serious harm. He said No, but that people differed in the amount of electricity they could stand. He told me of a laborer who came to him and said that he had heard electricity was good for rheumatism, and that he would like to know if this was true. The electrician offered to give him a trial treatment. He gave the man what would have been for most people a heavy shock, but the laborer scarcely felt it. He said, "It feels a little queer." The fact was that the man's hands were protected by thick, hard, dry skin. A very sensitive person with thin, moist skin could stand very little as compared with the amount this man could stand.

Burns caused by electricity are more difficult to heal than others. They are treated just as other burns are, according to their degree of severity. If the shock has caused unconsciousness, the clothing should be loosened and the body rubbed until circulation is restored. It may be necessary to try artificial breathing (see p. 127).

CHAPTER XXVIII

FOURTH OF JULY ACCIDENTS

The Fourth of July is our country's birthday. It is very natural for us to want to celebrate it in some emphatic way.

The American Medical Association Journal has been keeping a record of our celebrations for six years. In 1908, 5460 people, mostly children, were injured in some way or other, and 163 were killed. Eleven persons lost both eyes, 93 lost one eye, 57 lost either a leg or an arm or a hand, 184 lost one or more fingers. There were 76 cases of lockjaw. These deaths and accidents were scattered all over the country. If they had all happened in one place, as on a battlefield, people would become excited and something would be done, and that very quickly, to protect boys and girls from such awful deaths and injuries. Probably there are no more painful wounds than those caused by gunpowder or fire. There have been more people killed by celebrating the day of our independence than were killed in the Revolutionary War, — the very war in which we won our independence.

The doctors realize the dangers of the day. Many of them stay at home on the Fourth so as to be ready for accidents. The hospitals are all prepared for receiving

wounded boys and girls. Bandages and dressings and antitoxin for those likely to get lockjaw are all kept ready for immediate use.

The newspapers report many accidents like the following.

"Donald Graves is suffering from a badly burned face as a result of the Fourth of July celebration. Yesterday



THE SWEDISH FLOAT

morning he started to investigate a firecracker which had been lighted but had not exploded. Just as he turned it up to look at it, the cracker 'went off,' blowing his face full of powder and badly burning him."

Every grain of that powder had to be picked out of his face with great pain to him and long, tedious work for his doctor. Another boy loaded a tin can with powder

and attached a fuse. It did not appear to burn, but as he was standing over it, it suddenly exploded. His face was terribly burned and he had to be taken to a hospital.

Another case was reported of a boy and his two cousins, who improvised a small cannon out of the hub of a wagon wheel. They filled the hub with powder, and when one of them lighted the fuse the whole contrivance burst and sent a piece of iron into the brain of one of the boys. He died in half an hour.

In some cities the people are trying to find better and less harmful ways of celebrating the Fourth.

At Springfield, Massachusetts, on the Fourth of July, 1908, they had a great parade in the morning. Buffalo Bill happened to be in the city, and he and his followers took part in it. Each nationality living in the city was represented in a distinctive way. The Swedes, the Germans, the English, the Scotch, the Irish, the Poles, the Greeks, the Italians, the Syrians, the French, the Negroes, and even the Chinese took part in this great parade. Each nation illustrated in some way the



THE SCHOOLBOY BATTALION



WHAT THEY DID IN THE AFTERNOON



PUBLIC FIREWORKS AT NIGHT

customs or deeds of its ancestors. The schoolboys of the city had uniforms and carried wooden guns. In the afternoon balloons ascended and there were athletic games in various sections of the city. At night they had public fireworks in four different places. Every one had a good time and there were scarcely any accidents.

The most serious accidents on the Fourth are caused by toy pistols and cannon firecrackers. It hardly seems possible that a small toy pistol can do so much damage. I gave one to my little boy one Fourth, little thinking that they were the pistols



THE DANGEROUS TOY PISTOL

I had read about that were so dangerous. The fine powder from the caps often causes a little wound in the hand, and in this wound the dangerous germ of lockjaw finds a good place to live. This little germ, you remember, is called the tetanus germ. It lives in the earth. When a boy's hands are dirty,

as they are sure to be on the Fourth, the exploding powder is apt to carry into the flesh some part of the soiled skin, and this dirty skin often has tetanus germs on it.



TETANUS GERMS

Cases such as the following happen every year after the Fourth.

"Harry Corder, aged nine years, died from lockjaw. A toy pistol exploded in his hand on the Fourth. The boy's death was pitiful, for he was in terrible pain. The work of the poisonous germ was such that the little fellow's jaws became locked, and though everything was done for him, it was of no avail."

An antitoxin has recently been discovered which, if given in time, will prevent lockjaw. Most hospitals are supplied with it, especially on the Fourth.

A doctor who is at the head of a large hospital told me that the cases that came in several days after the Fourth are often the worst. He said, "You see, the boys get hurt and do not want to stop their fun, so they stuff their wounded hands into their pockets and do not tell their parents until after the Fourth is over. By this time inflammation has begun, and even if the tetanus germ does not get in, these cases are difficult to treat."

Toy cannon are very dangerous. Some boys handle them carefully and do not get hurt, but seven boys were killed by them in 1908 and three hundred and ninety-nine were injured. A friend of mine was at a meeting this year when some boy threw a cannon cracker in at the window. It exploded, and one woman was seriously hurt.

CHAPTER XXIX

WHAT MAKES A HERO

In Brooklyn recently a little boy coaxed a few pennies from his father, and said he was going to find Daisy. He found her, and the two playmates started off to buy apples. They had to cross some tracks to get to the apple stand. A car came along. The boy saw it coming—so did Daisy, but she was in the middle of the track and so frightened that she could not move. The boy with a cry sprang forward, and with a push sent Daisy sprawling out of the way; but although the motorman tried his best, the car ran over the little fellow. When the doctor came he heard the boy mumbling some word about Daisy, but his life was soon gone. In this boy's act there was splendid courage. He was a hero.

A six-year-old girl had been jumping rope on a bridge. The rope slipped from her hand, and in reaching for it she fell into the river. A boy looking out of the window of his home saw her fall. He rushed out, dived into the river after her, and with much difficulty brought her to the shore. This boy hero was eleven years old. This act took not only courage and the ability to act quickly but

also a knowledge of swimming. He would have been helpless if he had not possessed this special knowledge.

These two cases show how we can divide accidents into two groups according to what they demand of us. The first group demands courage and quick action; the second group demands not only courage and quick action but also special knowledge,—it requires preparation.

In crossing a street a boy rushes out and grabs his baby sister away from an approaching automobile. This is unselfish and heroic. It is fine. But suppose his baby sister falls into a river. He might be just as anxious to save her, but if he does not know how to swim, it would be useless for him to jump into the river. He would be perfectly helpless because of his lack of special preparation.

A girl might see some rat biscuit on the floor where her baby brother could get it. She picks it up and places it out of his reach. This act is thoughtful; it deserves our admiration, and the baby may owe his life to it. But supposing the baby has already found the biscuit and eaten some of it, does she know then what to do? It takes something more than thoughtfulness to help in this case. She needs to know that arsenic is the poison used in rat biscuit, and that the thing to do is to give an emetic,—something that will make the baby "throw up." Furthermore, she should know that warm water and mustard is the emetic to give. This is a case where knowledge is better than good intentions.

Many of the incidents given in this book show that boys and girls of our times are not lacking in courage. But our time demands of its boys and girls not only courage but also knowledge. Knowing what to do gives one courage. If Grace Darling had not known how to row she never could have helped her aged father rescue those people on that stormy morning.

A sudden accident is apt to show the character of a boy or girl. In an instant you know whether he is brave, courageous, plucky, cool-headed, and self-controlled, or just the opposite. In order to have these good traits, it is well to begin early. When a child burns a finger there is no use in fussing over it. It ought to be sensibly cared for, kept clean, but not fussed over. "Grin and bear it" is a good motto.

But we must remember that what may be perfectly natural and easy for one person might be very difficult for another. A man working on one of the East River bridges in New York City becomes accustomed to walking on the iron girders and has little fear of falling into the river far below. Yet for a person not accustomed to it, it would be a very brave and daring undertaking. Habit has much to do with bravery.

It is for us to choose whether we shall cultivate brave habits or cowardly ones. Scarcely a day passes that the papers do not record cases such as the following, of children who have chosen to cultivate the habit of bravery.

"Plucky girl of four, hurled fifty feet by a car, tells her grandmother not to cry. The child's leg was broken and she was hurt internally, but her first words were, 'Don't cry, Grandma, I am not hurt.'

"Laughs with surgeons. A little girl was badly cut by falling on a milk bottle which she was carrying down-stairs. The surgeon had to put in twelve stitches. She never made a cry. The only sign of pain she showed was in tightening her lips."

"Girl saves a baby sister. A girl seven years old rushed into the street to save her baby sister from being run over by an automobile. She was herself struck by the auto and had to be taken to a hospital."

Here is one where a ten-year-old girl, fully dressed, dives from a boat and saves a twelve-year-old boy.

Such acts of heroism on the part of boys and girls are not uncommon. It is expected of one to be brave. If one is not brave, we say, "How cowardly." But it is fine to be ready, so that when the occasion comes we can meet it with lightninglike quickness and without hesitation.

QUESTIONS

CHAPTER I

Do you know of any one who has never had an accident of any kind? Give two reasons why it is important to take care of slight cuts or burns. Why is it an act of bravery to take care of a little wound? Why do some wounds heal more quickly than others? Explain why the use of antisepsics has shortened the time for getting well allowed workmen who have been injured. Give some examples from your own experience of people who have been saved suffering by one who knew what to do in emergencies. What are the advantages in knowing what to do? Which is more important, to learn how to avoid accident or to learn what to do in case of accident?

CHAPTER II

How would you teach a brother or sister to handle firearms? What do you think of the habit of pretending to shoot any one? Do you know of any one who was ever shot by accident? How did it happen? Why is it bad to carry a gun pointed toward the feet? Why is it dangerous to strike loaded cartridges? Are air rifles dangerous?

CHAPTER III

What is the first thing to do if one is injured? Is it wise to try to carry a person who is severely injured? Show how a handkerchief seat is made. What kind of a knot should one make? Why is a "lady's chair" seat unsatisfactory? Show how a blanket seat is made. What

are the advantages of this seat over others? Why is it important in this seat to have the center of gravity at just the right height? Show another method of carrying an injured person. In what kind of accidents is it unwise to use this method of carrying? What position should the stronger person take? Give another method. How can a person who is unconscious be carried out of a burning building? Tell two ways in which litters can be made.

CHAPTER IV

Do you think motormen, firemen, or chauffeurs want to run over boys and girls? Why are there so many street accidents to children? Why do you think more children are run over by trolley cars than by other vehicles? How can children help to lessen these accidents? Tell how to get on a street car correctly. Which way should one face in getting on? What is the right way to get off? Which way should one face in getting off?

CHAPTER V

How many bones are there in the wrist? in the ankle? What holds these bones together? What happens when a wrist or ankle is sprained? Why is a sprain sometimes more serious than a broken arm or leg? Give two reasons why it is bad to allow blood and lymph to gather about a sprain. What is the first thing to do to keep the swelling down? What does cold water do? What does hot water do? Explain the process of bandaging a sprain. What do horse trainers do with a horse which has a sprained ankle? What is a simple method of treating a sprained ankle?

CHAPTER VI

Into how many groups have we divided wounds? Give examples of each group. Why are punctured wounds dangerous? Why is a wound that bleeds less dangerous than a wound that does not? What disease

often comes from rusty-nail wounds? Where is the home of the tetanus germ? How should one take care of a punctured wound? Give some way of avoiding nail wounds. How can fishhooks be removed from the flesh? Can a fishhook wound be deep? Why? Tell how wire cutters might be useful on a camping trip. How do we treat fishhook wounds? Why is it important to examine a needle on which one has stepped? If a piece is broken off, what should we do? Why should we take care not to leave pins and needles in clothes that are to be washed? Why are splinters sometimes dangerous? Tell about the case given in the book.

CHAPTER VII

What is the first thing to do in case of a cut? Why do we raise the injured part? What is the second thing to do? Why are tourniquets sometimes injurious? When are they necessary? How can cuts be held together without stitches taken in the flesh? Why is it important to keep a wound quiet while healing? Does the seriousness of a cut depend on its size or its position? Have you ever been injured by carrying your knife open? What is the safer way of carrying a knife? Is it wise to let little children run about with sticks in their mouths? Why? Explain how to wring a cloth out of boiling water without getting burned. When is it well to use hot cloths of this kind?

CHAPTER VIII

Will soap and water clean a wound sufficiently to satisfy a doctor? What more is necessary to clean a wound? What do antiseptics do? Give the name of the three antiseptics given in the book. How much water is used with one five-grain bichloride tablet? How much water is used with a teaspoonful of carbolic acid? Why should these two antiseptics be kept out of the reach of little children? How much water do we use with one teaspoonful of boracic acid powder? When is a wound

ready to be bandaged? When is a wound said to heal by "first intention"? When by "second intention"? Which way is the better? Give two reasons.

CHAPTER IX

What two kinds of bandages are there? Why do we use the triangular bandage? In case of an emergency what could one use for a triangular bandage? Give three reasons why square knots are better than granny knots. Make two kinds of slings with a triangular bandage. Make a scalp bandage. In what way can girls make use of scalp bandages? Make a hand bandage, a foot bandage, an ear bandage, and an eye bandage. How can you use surgeon's plaster?

CHAPTER X

Who are more fortunate in case of accident, country children or city children? Give your reason. What is the first thing to do if a child is accidentally run over in the street? Do you have to pay for the use of the telephone in case of accident or fire? Tell what you know about hospitals. Have you ever been in a hospital? Why is it better to have wounds cared for immediately? What does alcohol do to the machinery of the body? Do people who "drink" have more accidents or fewer accidents than those who do not drink? Are men who drink usually given responsible positions? What kind of a movement is going on throughout the world in reference to the use of alcoholic liquors?

CHAPTER XI

Have you ever seen flannelette on fire? What do some manufacturers do to reduce its inflammability? Can fire live without air? Why do we wrap a blanket or rug about a person who is on fire? In which direction do flames go? Why is it better to lie down if one is on fire? Which burns more readily, a cotton dress or a woolen dress? Why is it better to

wear a woolen rather than a cotton dress when playing around bonfires? In what ways should one be careful in using gasoline? Does it appear that children over six years old often get burned by playing with fire? Why are safety matches better than sulphur matches? Give two reasons.

CHAPTER XII

What is the first thing to do in case of burns? How is this most easily done? If large portions of the body are burned, into warm water of what temperature should the person be placed? Why is the person placed in warm water instead of cold? When can cold water be used? What is the normal temperature of the body? Is the temperature of our bodies the same in winter as in summer? Give four reasons why the water treatment is useful. Describe a first-degree burn, a second-degree burn, a third-degree burn. What method of treatment of first- and second-degree burns is good when the water treatment is not convenient? How can we exclude air from burns? Give two ways. How should third-degree burns be treated? What is caron oil? What other oils may be used? Why are scalds so often fatal? How should clothing be removed from a burned person? When should blisters be drained? What is the best way to drain a blister? Describe a sunburn. How should sunburns be treated? Tell why the hand shown in the picture is disfigured.

CHAPTER XIII

How much money does it cost the city of New York yearly to protect its people against fire? What kind of men enter the fire department? What examinations do they have to pass? What is said about drinking liquor? Do men under the influence of liquor save people from top stories of burning buildings? Did you ever visit a fireman's training school? Tell how many fires in New York City in 1906 were due to children's use of matches; to lighted cigars and cigarettes. Tell why it is a good plan

to shut doors and windows in case of fire. Explain why it is best to let the fire department save household goods. What must fire have in order to burn?

CHAPTER XIV

Give two reasons why the eyes of school children are taxed more now than they were a hundred years ago. What is the effect of this eye-strain as shown by the examination of the eyes of school children? How can boys and girls protect their eyesight? How can you discover for yourself the best position for studying? Why is the habit of correct sitting while reading worth forming? Give two reasons. How are our eyes protected from accidents? How do you remove a cinder from your eye? Why is it harmful to rub the eye? Give two methods of removing cinders. If a piece of plaster fell in your eye, how would you remove it? Give two ways of treating a black eye. What is a good eye wash?

CHAPTER XV

How can a dentist replace teeth? How can he make fast a loosened tooth? Explain how toothache is treated in a tooth in which there is a cavity; in a tooth in which there is no cavity. How can inflammation be checked? When do the first permanent teeth come? Why are these teeth liable to become decayed? What saying have the Germans in regard to healthy teeth? How often should the teeth be brushed? Are there exceptions?

CHAPTER XVI

Tell two ways of getting a bean or shoe button out of the nose. Why is it bad to try to push an object out of the nose? When does the nose fail to detect the odor of gas or smoke? Why do we keep the head erect when the nose is bleeding? What do we mean by coagulation of blood? Why is ice good for nosebleed? Explain how ice can

be applied to the nose. Give three other ways of stopping nosebleed. Explain the process of plugging the nose with cotton. Why is a string tied to the cotton? What children are most susceptible to nosebleed?

CHAPTER XVII

What is the first thing to do in case of poisoning? What is safe to give until the doctor comes? What is a good emetic? How is it prepared? What is the most important thing to remember in poison accidents? In case of acid poisoning what is the best remedy? In case of alkaline poisoning? Explain the effect of an acid on an alkali. What soothing remedy is it always safe to give? How is it prepared? At what age are poison accidents most common? Why is this? What precautions are necessary to prevent these accidents? What is the remedy for arsenic poisoning? What plants do you know that are poisonous to eat? If you were in the woods and had been poisoned by eating a poisonous plant, how would you produce vomiting? What is the treatment for tobacco poisoning?

CHAPTER XVIII

Have you ever seen children suck the heads off matches? Why is this dangerous? What is the treatment for poisoning by phosphorus? by turpentine? iodine? strychnine? gasoline? camphor? bichloride? blue vitriol? lye?

CHAPTER XIX

What is the treatment for whisky poisoning? Why are men who drink not given responsible positions? Why is one chicken on page 97 so much smaller than the other? Tell the story of Bum and Tipsy; of Nig and Topsy. Tell about the experiment with the tadpoles. What was the effect of alcohol on the tadpoles? Does it appear to you that alcohol is bad for growing animals? If alcohol stunts the growth of growing animals, is it likely that it injures an animal already grown?

CHAPTER XX

Why are more boys than girls bitten by dogs? How old are the boys who are usually bitten? What does this seem to indicate? What is a dog's way of self-defense? Did you ever see a mad dog? Why do you think the agents of the Society for Prevention of Cruelty to Animals have never had hydrophobia? Tell four peculiarities of mad dogs. Describe the way England exterminated rabies. What is being done in the United States? What is the treatment for dog bites? What is the treatment for mad-dog bites?

CHAPTER XXI

What is the name of the opening at the upper end of the windpipe? at the upper end of the esophagus? Which is the more serious to obstruct, the opening into the lungs or the opening into the stomach? Explain why one is more dangerous than the other. What does coughing indicate? Tell how you would dislodge an obstruction in the throat. What is the simplest way of preventing choking accidents? Why is it unsafe to swim alone far from shore? What is becoming the custom in long-distance swimming? What is a cramp? Describe two ways of relieving cramps. Can fainting be prevented? Describe the case of the girl in one of the New York schools. What is the cause of fainting? State five ways to relieve fainting. What is a good position to take if one feels that he is about to faint? What remedy is best of all? What would you do for a person having a fit? Did you ever have hiccoughs? How did you stop them? Give three ways of stopping hiccoughs. How did the old Greek philosopher Aristophanes stop his attack?

CHAPTER XXII

Can you give the reason why sunstrokes are more common in our climate than in the tropics? Give two ways of protecting oneself from

sunstroke. Why must a person who has once had a sunstroke be especially careful? What is the difference between sunstroke and heat prostration? What is the difference in treatment? What is a good way to treat a person who has become frost bitten? What is the cause of chilblains? What is the remedy?

CHAPTER XXIII

Give two reasons why it is worth while to learn to swim. How old were you when you learned? At what age do children usually learn? Why is it difficult for a very young child to learn? Do you know people who have forgotten how to swim? What is the one thing to remember if you fall overboard? When is the body lighter than the water it displaces? Give two precautions which it is always wise to remember when out in boats. When do we have the most accidents from drowning? What do you think of the plan of a winter volunteer life-saving corps?

CHAPTER XXIV

What did Professor Schaefer discover about the cause of drowning? What is the one important thing to do? Describe Professor Schaefer's method of artificial breathing. What more than giving artificial breathing can be done? What country has adopted Professor Schaefer's method? At what other times can artificial respiration be used?

CHAPTER XXV

What plants do you know that are poisonous to the touch? What is the poisonous element in poison ivy? What is a simple remedy for ivy poisoning? Give a medical remedy. Tell the difference between poison ivy and woodbine. Tell the difference between swamp sumac and other sumacs. What is the treatment for swamp-sumac poisoning?

CHAPTER XXVI

How many kinds of poisonous snakes are there in the United States? What are their characteristics? Tell in which part of the country each of these snakes is found. What proportion of people bitten by poisonous snakes die? What is the best treatment for snake bites? Explain the difference between the stinger of a honeybee and that of the wasp and the hornet. Give two simple remedies for bee stings.

CHAPTER XXVII

What good is there in fearing lightning? What attitude toward a storm is more wholesome than fear? How can this attitude be cultivated? State two precautions which it is well to remember during a thunder-storm. Which is more dangerous, lightning or the electricity in the wires of a city? How should one treat strange wires? What materials are non-conductors of electricity? How are burns from electricity treated?

CHAPTER XXVIII

What do you think about the way we celebrate the Fourth of July? Where are the doctors usually on the Fourth? Why? Describe how Springfield, Massachusetts, celebrated the last Fourth of July. Why are toy pistols dangerous? What is the treatment for tetanus? Why is it important to attend to wounds as soon as possible?

CHAPTER XXIX

Explain the difference in the heroism of the boy who saved his companion from being run over by a car and the boy who saved the girl from drowning. What does the first kind of heroism demand? What does the second demand? How does the knowledge of knowing what to do in emergencies affect the character of boys and girls? How can we cultivate habits of bravery and courage?

GLOSSARY

KEY TO PRONUNCIATION

a	as in fate, senator, fast, arm, all, ask, what, care.			
e	" mēte, ēvent, mēt, hēr, thēre, obey.			
ee	" fēēt.			
i	" ice, idea, It, sīr, machine.			
o	ōld, ôbey, nōt, mōve, wōlf, són, hōrse, wōrk.			
oo	fōod, fōot.			
u	ūse, ūnite, ūp, fūr, rūle, pūll.			
y	fly, myself, babȳ, myrrh.			
au	author.			
aw	saw.	ew	as in new.	oi
oy	boy.	ou	" out.	ow
c	(unmarked) as in call; ç		mice.	ci (= sh)
ch	(unmarked) " child; ch		" chaise;	eh (= k)
g	(unmarked) " go; g (= j)		" cage.	
ng	as in ring.	n (= ng)	ink.	ph (= f)
ſ(=z)	" is.	si (= sh)	tension; ſi (= zh)	" vision.
th	(unmarked) as in thin; th		" then.	ti (= sh)
x	(unmarked) " vex; x (= gz)		" exact.	" motion.
Obscure sounds: a, e, i, etc. Silent letters are italicized.				

ăç'īd, a sour substance which destroys an alkali.	ăntītōx'īn, a substance which makes a disease harmless.
ăl'kā lī, a substance which makes an acid harmless.	Ār īs tōph'ā nēs, a famous Greek scholar.
ăm ă nī'tā, a poisonous mushroom.	är ö măt'īc, a drug or plant having a fragrant, pungent smell.
ăm mō'nī ă, an alkali.	är'sē nīc, a poison.
ăntīsēp'tīc, a substance which kills microbes.	är tī fl'cial, not natural, made to represent something real.

bit chlō'rīde, one of the best anti-septics, a poison.

blüe vit'ri ol্, a poison used in electric batteries.

böräç'ic aç'id, an antiseptic; a good eye wash.

cäp'yl la ries, the smallest tubes connecting the arteries and veins.

cär bölk'ic aç'id, a good antiseptic; a microbe killer.

cär'rón oil, used for burns (made from equal parts of linseed oil and limewater).

cä thär'tic, a drug or medicine which cleanses the bowels.

cau'ter ize, to burn with a caustic.

chauf feur (shöf fér'), one who manages the running of an automobile.

chil'blain, a sore produced by exposure to cold.

çir cü la'tion, the movement of blood in the veins and arteries.

cö äg ü la'tion, the change of a liquid to a curdlike substance.

cön vü'l'sion, involuntary contractions of the muscles of the body.

dér'mis, the deep, sensitive layer of skin beneath the epidermis.

é mët'ic, a medicine which causes vomiting.

é pl dér'mis, the outer layer of skin.

é söph'a güs, the tube leading from the throat to the stomach; the gullet.

é väp ö rä'tion, the changing of a fluid into vapor.

éx për'i mënt, practical test.

fräc'ture, cöm'pound, the breaking of a bone in which there is an open wound.

fräc'ture, sim'ple, the breaking of a bone.

In dë pënd'ënce, the quality of being free from the control of others.

In fëc'tious, having qualities that may carry disease.

lär'ÿnx, the upper end of the wind-pipe.

lig'a ment, a fibrous band connecting the bones or organs of the body.

lit'ter, a bed or stretcher used to carry a sick person.

lymph, an alkaline, colorless fluid of the body.

mà nëp ü la'tion, the act of working with the hands.

mī'crōbe, an organism so small that you cannot see it without a microscope.

mūz'zle, to fasten the mouth of an animal to keep it from biting.

neū'trāl īze, to destroy the peculiar properties of a substance.

nōn cōn dūct'ōr, a substance which will not carry electricity.

ōx'ŷ gēn, one of the elements in the air which is necessary to support life.

pār'ā lȳze, to make helpless.

phār'ŷnx, the upper end of the tube leading to the stomach.

phī lōs'ō phēr, one who lives according to the rules of practical wisdom.

phōs'phōr ūs, a poisonous element much used on the tips of matches.

prōs trā'tiōn, being deprived of strength.

pūr'gā tīve, a medicine which purges or cleans out the alimentary canal.

rēs pī rā'tiōn, the act of breathing.

rē sūs cī tā'tiōn, the act of making one breathe.

rēv ḍ lū'tiōn ḍ rȳ, pertaining to the revolution of a government, as the Revolutionary War.

sāl'vāge cōrps, a body of men who save goods that are in danger by fire or water.

sān'ī tā rȳ, pertaining to health; hygienic.

shōck, a change caused in the body by a disturbance of the circulation of the blood.

spī rōm'ē tēr, an instrument to measure the amount of air taken into the lungs.

strȳch'nīne, a poison.

sūs qēp'tī ble, readily acted upon.

sȳr'īngē, a small hand pump for throwing a stream of liquid.

tăd'pōle, the young of a frog.

tēt'ā nūs, a dangerous disease (lockjaw).

tour'nī quēt, an instrument to hold (ōō) (k)

back the flow of blood.

tūr'pēn tīne, a poisonous fluid.

twē'e'zērs, small pinchers.

vōl'tāgē, a measure of the quantity of electricity.

wā'tēr mōc'ā sīn, a poisonous snake.

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